REPORT RESUMES

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SCHOOL PLANT MANAGEMENT FOR SCHOOL ADMINISTRATORS.

BY- ENGMAN, JOHN DAVID

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THIS REPORT IS A COMPILATION OF STUDIES ON SIGNIFICANT ASPECTS IN SCHOOL PLANNING AND OPERATION. A RELATIONSHIP IS SHOWN BETWEEN CURRICULUM, PERSONNEL AND AUXILIARY SERVICES IN EDUCATIONAL PROGRAM OPERATIONS. THE REPORT INCLUDES PLANNING, MANAGEMENT AND OPERATION OF SUCH AREAS AS--NONINSTRUCTIONAL PERSONNEL POLICIES, CUSTODIAL SERVICES, OPERATIONAL AND PREVENTIVE MAINTENANCE, AESTHETICS AND THE SCHOOL PLANT, PLANT UTILIZATION, COMMUNITY RELATIONS, PLANT SAFETY AND HYGIENE, SCHOOL MODERNIZATION, THE SCHOOL BUSINESS OFFICE, AND THE EVALUATION OF PLANT MANAGEMENT PROCEDURES. RECORD, ORDER AND EVALUATION FORMS AS WELL AS BIBLIOGRAPHIES ARE INCLUDED FOR A NUMBER OF THE STUDIES. THIS DOCUMENT IS ALSO AVAILABLE FROM THE GULF SCHOOL RESEARCH DEVELOPMENT ASSOCIATION, 3801 CULLEN BOULEVARD, HOUSTON 4, TEXAS, FOR $2.50. (GM)

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School Plant Management
For School Administrators

JOHN DAVID ENGMAN

A Publication of the
Gulf School Research Development Association
3801 Cullen Boulevard Houston 4, Texas
1962

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SCHOOL PLANT MANAGEMENT
FOR
SCHOOL ADMINISTRATORS

by

John David Engman, Ed.D.

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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Price$2.50

PREFACE

More than eleven authors, each a distinguished specialist in his field, have combined their experience to write this unique textbook in an area of school administration generally acknowledged as necessary and fundamental but concerning which available literature has been meagre. The individual authors, most of whom are presently or were formerly located in member school districts of the Gulf School Research Development Association, are acknowledged in the Table of Contents for their chapter contributions.

Dr. John David Engman, who had been research assistant to the association, edited the entire publication and contributed useful checklists, practical illustrations, and content outlines. His perseverance in this task over a period of three years resulted in a comprehensive study guide for the area of school plant management. Our readers are encouraged to add other criteria and illustrative solutions to the problems discussed in these chapters.

Wallace H. Strevell,
Executive Secretary,
Gulf School Research Development
Association

Houston 4, Texas
September 1962

FOREWORD

The public school administrator is the executive head of one of the largest businesses in any city or county. His is a unique function and complex, for he is responsible for tremendous investments in real property and for the lives, safety, and well-being of thousands of children. In the day to day exercise of his function, the demands made upon his time, ability, and judgment are many and varied.

The most important function of the school head is the administration of the instructional program. To this responsibility he should devote the major portion of his time.

Good teaching requires a good learning environment. There is no question that the atmosphere of a school depends considerably upon the quality of care given the plant and its equipment. Schools can be truly effective only in a system which provides a well-planned, well-supervised program of services to enhance the educational climate.

This project has been an attempt to put into print much of the needed information which is basic to the proper functioning of a program of school plant management. The editor has assembled this information with the assistance of the authors of the various chapters, from a survey of the literature available, from a questionnaire devised for the study, and from conferences and correspondence with professional practitioners in education and industry. This is not an exhaustive treatment, but does represent a cross-section of collective thinking and current practice in school plant management in the Gulf Coast area of Texas.

It is the hope of the collaborators in this work that it will serve as a guide for the local administrator in his efforts to upgrade his management services, and a device which will help to expedite this aspect of his work and release to him valuable time for creative educational leadership.

J. D. Engman,
Project Researcher and Editor

June 1962

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CHAPTER I

MANAGEMENT RESPONSIBILITY OF THE SCHOOL ADMINISTRATOR

The administration of public schools has become a complex array of tasks which require a high order of management skills. Although emphasis may be placed on a specific talent at various times, public school management is a total skill, a sum of many tasks, each bearing a relationship to the whole. Good educational management comprehends this responsibility and gives due emphasis to the separate tasks as becomes necessary.

The work of school plant management therefore depends upon an understanding of the total philosophy and purposes of the school. It is a complex of its own within the total pattern faced by the school administrator. The administrative responsibility for plant management may be divided into functions or areas and thus treated as chapters. Chapter I will outline the general nature of management.

Management Means Leadership

The basic approach to management is an awareness and acceptance of responsibility for leadership. This leadership involves decision-making, securing understanding by good communications, and the selecting, developing, and motivating of people.

Origin of Authority

The school superintendent is an agent of the board of education who in turn represent the school district. As such, his authority and responsibility comes from the board. His duty, then, is to be familiar with the limits of authority and responsibility given to the school board under law and practice. He must conduct his work for that body in such fashion as to fulfill the obligations required of or directed to the board of education.

Article VII, Section 1, of the Constitution of the State of Texas, states that, "A general diffusion of knowledge being essential to the preservation of the liberties and rights of the people, it shall be the duty of the legislature to establish and make suitable provision for the support and maintenance of an efficient system of public free schools."

The Texas state legislature has carried out this mandate by organizing the entire state into legal school districts. It has also provided that boards of trustees shall be local governing officials for these districts in carrying out the legislative mandates and exercising such discretion as may be permitted by law or accepted practice for conducting an educational program.

Legal authority and responsibility fall into two general categories--mandatory (in terms of exact, or minimum, performance) and permissive. The requirement that an annual budget hearing be held is an exact mandated responsibility; the Gilmer-Aiken salary schedule is of a minimum mandated nature. The prescribed and implied powers of local boards to make decisions concerning their own school programs is an example of permissive legislation.

The Texas state legislature, the Attorney General, and the State Department of Education, charged with establishing and interpreting the legal basis of Texas public school law, cannot possibly anticipate all of the situations and procedures when writing a statute, devising policy, or deciding a case on its merits. Out of the dynamics of such a situation comes the need for local school officials to experiment with new techniques and practices. When innovations meet with the approval of local people and no interested party feels himself aggrieved, the matter is seldom subject to a formal determination of legality.

Some of these innovations will be discarded because they fail to attain desired objectives. Others may spread slowly until they become accepted general practice, and may become the subject of future legislative action or state administrative mandates.

Criterion

The use of discretionary power demands good faith and an absence of intent to evade the restrictions of other statutes and regulations. The objective test of local power usually hinges on whether it is "arbitrary or capricious," or whether it is a thoughtful application of a procedure that is designed to further the education of the children, protect the interests of the district and its people, and protect the interests of the people of the state as a whole.

Decision-Making

The leader of an organization makes decisions as a matter of prerogative and duty. Others look to him for orders, for settlement of problems. This is a prime obligation and responsibility of management, to make the correct decisions and to communicate understandable directions to implement the decisions.

Statement of Educational Philosophy

A stable basis must be sought for making decisions, rendering judgments, and programming management. The administrator and his staff must first devise a comprehensive statement of the educational requirements of the school system. Emphasis on the need for such a statement gives the educator a real job in developing school plant management procedures and program. Supported on the solid ground of *educational needs*--within the sphere of his competence--the school executive can make a skillful, indispensable contribution to the management of his school plant.

The school administrator's most pressing problem is people--selecting, developing, and motivating people. No area in management is more important, nor more difficult, than the human relations problem. Development of policies for management of personnel is the theme of Chapter II. Chapter X contains suggestions concerning community relations.

Management Means Planning

A statement of educational philosophy being a necessary preliminary step to programming for school management, such statement should set forth clearly the educational goals and objectives. These objectives are derived from a thorough study of the educational needs of the community served by the school system. The school administration can glean a wealth of information on which to predicate needs by means of census reports, public utility company statistics, Chamber of Commerce and other data on housing, population trends, etc.; from certain information gained from school records--attendance, tax records, budgeting information; from information concerning school groups--student council, various clubs, athletic teams; from teachers and other staff members; and from such school related groups as the Parent-Teacher Association. Such needs indicate the policies and goals of school management operation.

CHECKLIST OF CRITICAL ADMINISTRATIVE DECISIONS
IN PROVIDING SCHOOL PLANT MANAGEMENT

Basis of Needs:

- Census
- Building survey
- Inspection reports
- Staff analysis

Priority of Needs:

- Urgent; emergency
- Immediate
- Deferred
- Long-range

Permanence of Needs:

- Population study
- Evaluation study
- Projected requirements

Program Formulation:

- Schedule of work to be done
- Job specifications
- Board approval

Personnel Assignment:

- Roster
- Capabilities
- Own staff or contracted labor

Project Completions:

- Progress
- Inspections
- Board acceptance
- Utilization

Forecasts

The results of studies as referred to above can be tabulated graphically--on flow-charts, on a map of the school district, or by bar and line graphs--in order to project future needs and to secure community support of improvement programs which might call for a larger expenditure of funds. This is not only good management technique, it is also a fine public relations device. The superintendent, as chief management executive of the school system, assumes the prerogative to continuously study school plant needs, collecting and interpreting data for the school board and the community.

Needs can be classified as immediate and urgent, routine, or long-range. Management should next proceed to the task of programming by sequence and time schedules. The decisions must be based on the priority of established needs, the amount and quality of personnel available for the tasks, and the amount of funds available for the various necessary projects.

Budgeting

Budgeting for school plant needs is a precise responsibility of management work. A properly prepared school budget will show a detailed statement of the comprehensive plan for maintenance and operation of the school plant. Properly executed, the school budget is an instrument for controlling the activities of the system within the bounds established by the plan. A good budget is a systematic means to help the administrator see clearly the financial aspects of the established objectives of the total school activity, and to measure his success in accomplishing them. A budget shows the allocation of both material and personnel.

Management Means Organizing

The school superintendent, as executive officer of the school board, recommends policy, personnel, and procedure. He advises the school board on all phases of the program. As educational leader of the community, he takes responsibility for the entire school plant in all its aspects and uses. His responsibility in school plant management is essentially organizational.

The fundamentals of an efficient organizational pattern for school plant management are:

1. Control of the number of personnel needed.
2. Securing and training a loyal and skilled working force.
3. Establishment of work on a long-range priority basis.
4. Development of lines of communication.
5. Development of standard practices.
6. Planning work schedules and reporting.
7. Careful budgeting and record-keeping.
8. A positive human relations program.

These items exist to a degree in any size or pattern of school organization.

School Board Policies

Management operates ethically and astutely only when defined by written policies. These general policies, as suggested and developed by the school superintendent, are approved and published by the school board. They may be amended and added to as practice demands. Periodically they should be studied with a view toward their consistency and purpose in the light of actual needs.

The school superintendent, as a management function, interprets policy to his staff and to the public, and implements policy in organizing for operation of the school.

Organizational Structure

Included in the written school board policies should be an organizational chart, showing the line and staff organizational structure of management. Each school employee must know to whom he is responsible and where he fits into the organizational picture. A sample organizational chart is included in this chapter, page 11.

The size of organization for which this text is written is a school district having from 1,000 to 5,000 enrollment. Administrators of larger school districts than this would require more specialized types of organizational charts.

Delegating Responsibility

Perhaps the most important duty which accrues to any executive is the delegation of authority and responsibility. Competent, trained subordinates are the essential key to an efficient organization. The administrator needs to develop his assistants, principals, supervisors, department heads and foremen, to train them not only in their jobs, but in an understanding of the philosophy and purposes of the school.

Delegation of responsibility signifies decentralization of authority, and must be approached with caution and guided by specific written policies and discrete administrative controls.

Decentralization poses some interesting challenges to management, some of which are:

1. Development of leadership in staff members.
2. Leadership by persuasion rather than by command.
3. Achievement of teamwork, integration, and balance.
4. Proper use of all types of compensation.
5. Development of good communications.
6. Development of criteria for determining the scope of the program at grade levels, departmental levels, and for the school as a whole.

Among the functions a superintendent may wish to keep at the central staff level are employment, assignment and promotion of personnel, budget-decision, payroll, purchasing and contracts, inventory of property, and accounting. He can delegate most of the day-to-day management of operation to the principal, however the principal should not be excluded from advisory conferences on policy.

Regardless of seeming importance of other duties, the administrator, conscious of his total program, will find the time to meet with his employees, formally at staff conferences, and informally on random visits. As a morale factor, this cannot be over-emphasized.

The Building Principal

The principal of a building (school) is responsible for the physical condition of his part of the plant, and should be delegated proper authority over the staff which is assigned to work for him. He should make daily, weekly, and monthly inspections as directed by the superintendent, furnish periodic reports on the physical state of his building(s) and make requests to central authority for whatever work is needed that cannot be accomplished by his own staff.

A practical plant management operation should be guided by the advice and assistance of experts. The wise school superintendent will use local individuals and his own competent maintenance staff to assist in studies, formulation of plans, and promulgation of policy.

Reliance on Staff

It is not to be expected that the superintendent shall know as much about floor finishing as his chief custodian, but it is his responsibility to engage someone who does know, and to make sure that time and materials are available to get the job done.

The administrator who wants to learn more about maintenance might attend every meeting (weekly) of his custodial staff, make monthly (or more often) inspections of the entire plant with his maintenance foreman, check inventories periodically, scan purchase orders and monthly invoices, and attend his own in-service custodial schools. In this manner he may better understand the maintenance and operation budget and the allocation of material and personnel.

Teachers

School building facilities are tools in the hands of teachers. The quality of a teacher's work is affected by the tools with which he works. Since he lives with these tools and works with them day after day, he is in better position than anyone else to know their advantages and disadvantages, to know what he needs and what he does not need, and to suggest practical improvements. Therefore, it is the superintendent's responsibility to make it possible for professional personnel to have a hand in planning the school plant, and the services the schools provide.

Staff Training

School employees need to be told what to do, and when, and, if they are lacking in experience or skill, "how" and "why." This implies necessary instruction. It points up the value of in-service training programs (see Chapter III). In this regard, a weekly departmental staff meeting is advised--perhaps over a cup of coffee--to work out mutual problems, lay out work schedules, receive instructions, and build morale.

Management Means Controlling

In small school systems, the innumerable details of managing the entire plant fall heavily on the shoulders of one man. He must not only do all of the planning, organizing, and directing--typical functions of top management--but must usually also struggle with problems of personnel, transportation, health, lunchroom, etc. The result is an overload of work and confusion of perspective. Too often, instead of managing, he finds himself managed--by pressure of events.

Medium sized and large districts are in a better position. They are able to employ more help--clerical, specialists, etc.--but as responsibility is delegated, unless he has well-organized control information, the administrator is flying blind.

The answer lies in control, and the elements of effective control are:

1. Information, statistics, and coordinated reports.
2. Policy conferences with principals, supervisors, and department heads.
3. Delegation of responsibility to trained, loyal people.
4. "Clear channel" communications.
5. Surveillance and evaluation.

Briefly, the administrator's job of control may be defined as recognizing, predicting, and influencing trends of important phases of the educational program so that preconceived goals may be achieved.

Management effects its control of the total school plant operation by holding to established standards. These standards will be deluxe, average, or poor, depending on what the school district wants and can afford. Statements of these standards are either posted on staff bulletin boards, included in the written policies, expressed as written rules and regulations, or detailed as a manual for procedure.

Another major controlling factor is the measurement of performance of selected tasks performed by school employees, to assess whether or not standards of performance are being met. Chapter XV contains checklists which can be adapted for this type of measurement. Evaluation or judgment, which is a third major factor in management control, is treated in Chapter XV.

Surveillance (inspections) illustrates control. In the area of school maintenance, for example, a good inspection program is essential to a comprehensive plan of maintenance because:

1. It reduces the number and magnitude of emergency repairs.

2. It lessens interference with regular school activities.

3. It lessens expensive routine repairs.

4. It regulates the work load.

A school principal alert to the economy of maintenance would have the head custodian of each building make regular inspections of all facilities in order to anticipate maintenance needs, and at least once per month, during the school term, the administrator should tour the buildings and grounds with his head custodian or maintenance chief, working by and with a checklist. (Refer to sample forms, Chapter XV, which can be reproduced on the school duplicator.)

Records are kept of such inspections. Follow-ups are a natural consequence--to assure that the work is accomplished. The reports are part of the superintendent's periodic reports to the school board, predicating his budget requirements, and guiding his thinking on future planning.

Long-range plans should be reduced to writing, readily available, and periodically reviewed in school board meetings.

Summary

The general responsibilities of the administrator with respect to school plant management are: (1) Leadership; (2) Planning; (3) Organizing; and (4) Controlling.

His specific or implicit responsibilities include the following:

1. The administrator arranges to employ and train employees so as to develop an efficient and flexible working force.

2. He arranges work schedules, plans, and instructions for the guidance and morale of his employees.

3. He makes continuous studies of educational needs as a basis for managerial programming.

4. He supervises the entire management operation, seeing that policies, procedures, and standards are adopted which will assure attainment of optimum goals.

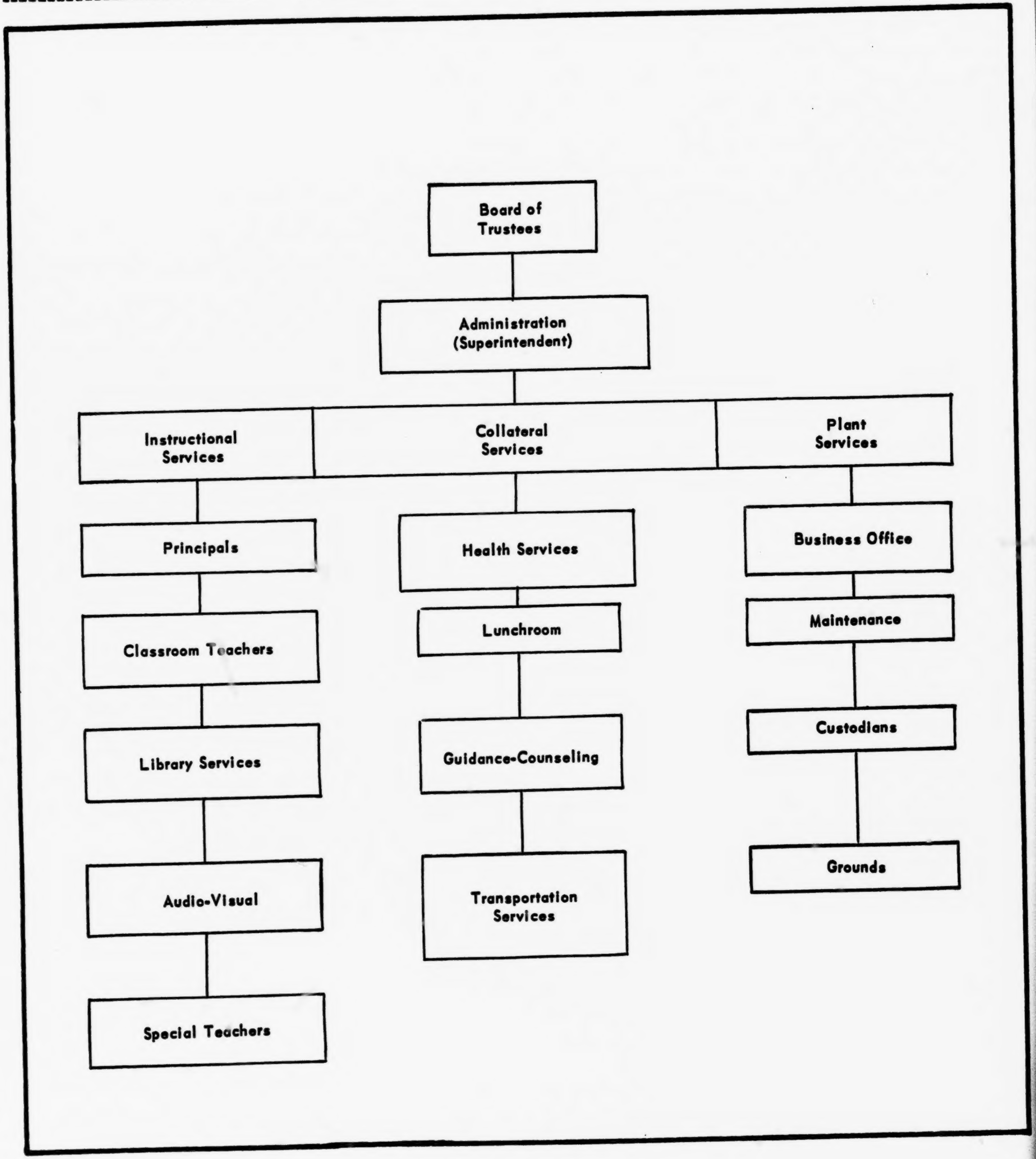
5. He is responsible for both quality and quantity of output.

6. He is alert to plans, processes, and equipment which may increase the productivity of the operation.

7. He constantly inspects and periodically evaluates his management processes in the light of established standards and educational objectives.

BY____________DATE________ SUBJECT________________________________ SHEET NO.________OF______

CHKD. BY______DATE________ ________________________________ JOB NO.____________________


Board of Trustees
Administration (Superintendent)
Instructional Services
Collateral Services
Plant Services
Principals
Classroom Teachers
Library Services
Audio-Visual
Special Teachers
Health Services
Lunchroom
Guidance-Counseling
Transportation Services
Business Office
Maintenance
Custodians
Grounds

LINE AND STAFF ORGANIZATION

Figure 1.

Suggested Readings

Anderson, Vivienne and Daniel Davies, Patterns of Educational Leadership, Prentice-Hall, Inc., Engelwood Cliffs, N. J., 1956. Develops the theme of administrative responsibility from a study of modern trends.

Campbell, Roald F., and Russell T. Gregg, Editor, Administrative Behavior in Education, Harper and Brothers, New York, 1957. A critical analysis of the rationale of school administration.

Ducker, Henry C., "Try a Check List, Mr. Superintendent," School Executive, 74:46-47, July, 1955. Presents many suggestions for good school management by the use of checklists.

Herrick, John H., and others, From School Program to School Plant, Henry Holt and Company, New York, 1956. Furnishes valuable administrative concept of planning the plant to suit the educational program.

Hinsley, J. C., The Handbook of Texas School Law, The Steck Company, Austin, Texas. Outlines all existing state laws regarding public education, plus case quotes and Attorney General opinions in all sections. A must for every school administrator's desk.

Miller, Floyd A., "Hazards for the Administrator," American School Board Journal, August, 1959, p. 18. Considers some of the pitfalls in school administration.

"Myths and Facts to Answer the School-Baiters," School Management, August, 1959, p. 16. Provides some good suggestions for dealing with a critical public.

"Programming School Needs," Bulletin, Texas Education Agency, Austin, Texas, 1958. Covers the important management area of ascertaining needs.

Richards, Max D., and William A. Nielander, Readings in Management, South-Western Publishing Company, Cincinnati, 1958. Examines the theory and practice of management in industry.

Rose, T. G., and Donald E. Farr, Higher Management Control, McGraw-Hill Book Company, Inc., New York, 1957. Offers a handbook of practical management principles.

Sears, Jessee B., The Nature of the Administrative Process, McGraw-Hill Book Company, Inc., New York, 1950. Clarifies the nature of the administrative process and explains the laws by which it operates.

Source Book for School Plant Management, University of Houston Administration-Supervision Workshop Proceedings, 1958, University of Houston Bookstore. Examines briefly the administrative aspects of school plant management under 34 separate topics.

CHAPTER II

DEVELOPING NON-INSTRUCTIONAL PERSONNEL POLICIES

The administration of personnel is a highly significant educational management function. It concerns the people who make up the organic structure of the educational process, who are subject to all the strengths, frailties, and vagaries of human nature. Since the success of the educational enterprise depends upon the efficiency of its personnel, the management of personnel becomes the administrator's most important function.

There is a large body of school personnel whose duties are not performed directly in the classroom, but whose services promote and enhance the instructional processes, services which are indispensable to an efficient school system. It is this non-instructional management function we propose to discuss in this chapter. The approach taken is the viewpoint of an industrial personnel official describing how industry might develop policies dealing with non-instructional personnel.

Non-Instructional Personnel Policies

The school superintendent's most important job in managing a school plant is selecting and motivating people. He deals with them in straightforward ways, much of which can be written down for guidance as clear rules of action called personnel policies.

Responsibility

The superintendent directs the writing of these non-instructional personnel policies and presents them to the school board for adoption. He is responsible for proposing revisions to the existing policies and for making a complete policy review every three to four years.

The written policies state exactly how the superintendent treats his people, what they may expect in most situations that arise, and what likely will be the pattern of new judgments in situations arising for the first time. Policies must make sense. The "steady state" of personnel management floats or sinks on how much sense employees can make out of the policies by which they are governed.

Developing Policies

Some considerations in developing personnel policies are:

1. Hiring: Job application (written and interview)

Review by personnel head and foreman of work area

Appointment procedure (notification of appointment, where and when, and to whom to report)

Orientation

2. Probationary period: (six to twelve months)

Work report (written appraisal by supervisor)

Personal assessment by supervisor

Conference to terminate or establish tenure

3. Work hours: (dependent on local conditions)

40-50 hours weekly, 1/2 day on Saturday

Split shifts (night duties)

Work schedules posted (duties and hours)

4. Job benefits:

School holidays allowed

Sick leave and emergency absences

Group insurance

Social security, retirement plan

5. Responsibility:

To whom directly responsible

Supervisory responsibility over other workers

Responsibility for tools, machines, and supplies

Responsibility to students, teachers, and public

6. Termination procedures:

Notice of dismissal

Termination pay

Grievance committee, or board of review

Qualifications should be established regarding:

1. Age: the employee should be at least 20 years of age and should have at least 10 good years, preferably longer, before retirement.

2. Physical ability: the employee must be physically able to do the work required of him or her; no history of chronic illness, no incapacitating injuries.

3. Level of education: this depends on the nature of the work to be performed; at least a grammar school level for matron or apprentice class up to college level for supervisory maintenance.

4. Intelligence: again, this may vary according to demands of job. Range of 90 to 110-plus should be standard.

5. Experience: preferably, similar work to job applied for is helpful, but good work record at any job is desired; a good rule--the higher the classification, the more experience is necessary.

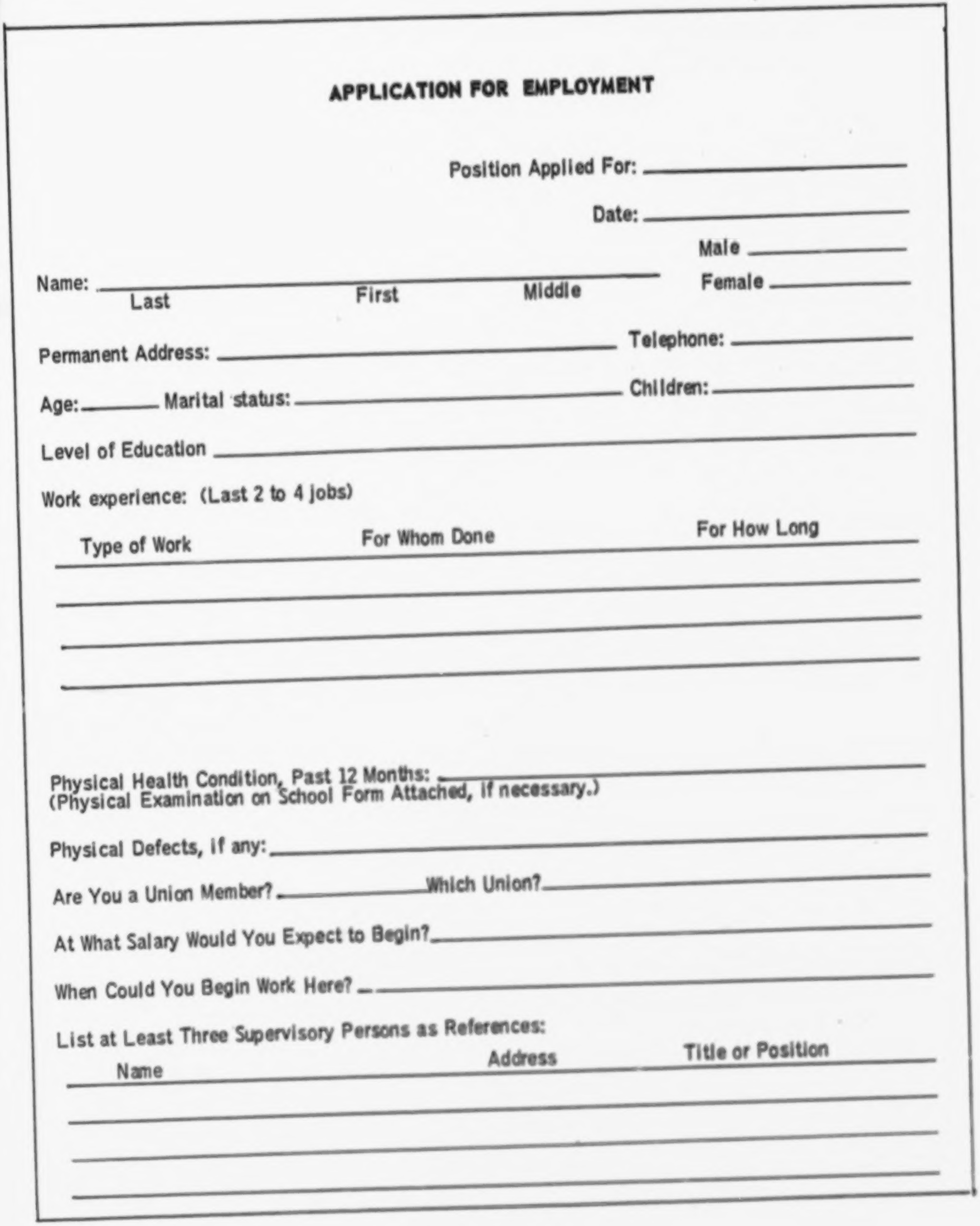
6. Attitude: difficult to assess, but important to success. Employer may learn little from interview, more from telephone call to former employer, most from observation during probationary period.

7. Ability to follow verbal orders.

Much of the above can be ascertained from the written job application. The remainder can be assessed by means of written and performance tests, as desired.

Part of the written policies are rules and regulations for day-to-day conduct of non-instructional personnel. These statements are generally posted in custodial spaces and shops, and cover the following items:

1. Personal appearance: neat, clean, in uniform, if required.



APPLICATION FOR EMPLOYMENT

Position Applied For: ____________

Date: ____________

Male ____________

Female ____________

Name: ______________________________
Last First Middle

Permanent Address: ____________ Telephone: ____________

Age: ______ Marital status: ____________ Children: ____________

Level of Education ____________

Work experience: (Last 2 to 4 jobs)

Type of Work	For Whom Done	For How Long

Physical Health Condition, Past 12 Months: ____________
(Physical Examination on School Form Attached, if necessary.)

Physical Defects, if any: ____________

Are You a Union Member? ______ Which Union? ____________

At What Salary Would You Expect to Begin? ____________

When Could You Begin Work Here? ____________

List at Least Three Supervisory Persons as References:

Name	Address	Title or Position

Job Application Form

Figure 2.

2. Smoking, drinking: smoking allowed in specific areas, safety rules strictly observed. No drinking on job. Evidence of liquor on person or breath makes offender liable to immediate dismissal.

3. Tardiness, absences: reporting to work at stated time, giving notice of emergency absence, permission asked for leave of absence.

4. Personal mail and telephone calls: no personal mail to come through school box, personal telephone calls to be kept on emergency basis.

5. Personal visitors: allowed within reason, not to interfere with duties.

6. Solicitors: none allowed while on job.

7. Personal use of school shops, tools, equipment: allowed only as other faculty or staff may use, on rental or replacement basis.

Salary Policies

Industry generally uses job (position) classification as a basis for salary schedules. Many schools also use this device. Among Texas Gulf Coast schools making use of job classification policies are the Brazosport, Orange, and Houston Independent School Districts.[1]

Basic Classification Factors

The following five factors are often referred to as the basic, or ultimate, classification factors. They identify the five broad elements which may exist in varying degrees in all positions, and which must be considered in arriving at a classification:[2]

1. Subject matter, function, profession or occupation represented (nature of work)

2. Difficulty and complexity of duties

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[1] J. D. Engman (ed.), A Survey of Selected Gulf Coast Schools, 1961.

[2] U. S. Civil Service Commission, Basic Training Course in Position Classification, Part II, p. 4.

3. Nonsupervisory responsibilities

4. Supervisory and administrative responsibilities

5. Qualification requirements

These factors may be applied to the evaluation methods which follow, to give the position classifier a basis for the organization of a classification system.

Job Evaluation Systems

Four principal methods or systems of job evaluation are in use today.[3] Each system has its own form of standard which serves as a tool for the analyst or classifier in making his measuring judgments. In none of these methods is the element of making judgments removed.

1. Job ranking--jobs are roughly evaluated and placed in a sequence from the lowest level of difficulty to the highest.

2. Point rating--the standard is a mathematical score based on total points assigned to various factors. The basic factors listed above may serve as a basis for determining point values. This method is most frequently used in industrial classification plans.

3. Factor comparison--the use of points assigned to certain key jobs, based on responsibility, decision-making, technical skill, qualifications required, etc.

4. Predetermined class system--the standards are written descriptions of the kind and level of work in each class.

Any plan involving classification of position should take into consideration the following features:[4]

1. A basic minimum salary for each position.

2. Service increments based on qualifications and length of service.

3. Pay increases based on value to the system.

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[3] _Ibid_., p. 36.

[4] "Developing Certified Personnel Policies," _American School Board Journal_, November, 1959, pp. 15-17.

4. Welfare provisions to attract and retain qualified employees.

Following is a list of classified positions which might be applicable to the Texas Gulf Coast:

Matron - custodial maid services.

Apprentice - general beginning class, custodial or maintenance.

Cafeteria Worker I - general cafeteria work, unskilled.

Cafeteria Worker II - skilled; cook, baker.

Head Custodian - skilled, supervisor of custodians.

Custodian - general cleaning chores, ability to handle machines, minor repair work.

Clerical I - general school office duties, filing, typing, duplicating.

Clerical II - business office, payroll, taxes.

Maintenance I - semi-skilled maintenance work; general painting, glazing, grounds care.

Maintenance II - skilled maintenance work; plumbing, electrical, carpentry.

Secretary I - typing, shorthand, duplicating; registrar's, principal's offices.

Secretary II - superintendent's, business manager's offices; skilled secretary, receptionist.

Maintenance chief - skilled, supervisor of maintenance workers.

A sample salary schedule for the above classifications appears in Figure 3, this chapter.

The Westfield, New Jersey, public school system has devised a program of staff evaluation. The program involves (1) selection and orientation, (2) observation on the job, and (3) the post-observation conference.[5] This program is deemed to be vital to the successful operation of the school system. Its values are described:

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[5] "A Sound Staff Evaluation Program," The American School Board Journal, July, 1960, p. 15.

POSITION	FIRST YEAR		SECOND YEAR		THIRD YEAR		FOURTH YEAR		FIFTH YEAR		MAXIMUM	
	Year	Hour	Year	Hour	Year	Hour	Year	Hour	Year	Hour	Year	Hour
Matron*	1,775	1.25	1,817	1.28	1,860	1.31	1,917	1.35				
Apprentice	2,704	1.30	2,808	1.35	2,912	1.40	(To custodial-maintenance status)					
Cafeteria I*	1,888	1.33	1,917	1.35	1,960	1.38	1,988	1.40				
Cafeteria II*	1,988	1.40	2,030	1.43	2,087	1.47	2,130	1.50	2,172	1.53		
Custodian	3,016	1.45	3,078	1.48	3,186	1.53	3,286	1.58	3,390	1.63	3,536	1.70
Clerical I +	2,400	1.50	2,448	1.53	2,496	1.56	2,560	1.60	2,592	1.62	2,640	1.65
Maintenance I	3,186	1.53	3,286	1.58	3,349	1.61	3,432	1.65	3,494	1.68	3,598	1.73
Maintenance II	3,328	1.60	3,432	1.65	3,536	1.70	3,640	1.75	3,744	1.80	3,848	1.85
Clerical II	3,349	1.61	3,453	1.66	3,478	1.72	3,682	1.77	3,806	1.83	3,910	1.88
Secretary I+	2,608	1.63	2,688	1.68	2,768	1.73	2,880	1.80	2,960	1.85	3,040	1.90
Secretary II	3,577	1.72	3,640	1.75	3,786	1.82	3,910	1.88	4,014	1.93	4,118	1.98
Head Custodian	3,848	1.85	3,952	1.90	4,056	1.95	4,160	2.00	4,264	2.05	4,368	2.10
Maintenance Chief	3,910	1.88	4,014	1.93	4,118	1.98	4,264	2.05	4,368	2.10	4,472	2.15

Legend:

* = Employed 9½ months.
+ = Employed 10 months.
All others on 12 month basis.

Source: Adapted by the editor from School Management, September, 1959, p. 54,

Illustrative Salary Schedule for Non–Instructional Personnel

Figure 3.

1. Leads to self-understanding of the employee.
2. Leads to a broader understanding of the nature and scope of his work.
3. Leads to employee's growth in his job.
4. Offers employee and administrators a two-way opportunity for discussion of professional problems.
5. Offers opportunity for establishing good employee morale.
6. Offers opportunity to increase the mutual understanding of the needs, goals and personalities of the appraiser and employee.

The program calls for at least one evaluation of performance yearly, more if desired, and includes continual follow-up techniques. Evaluations are made by a member of the administrative staff or maintenance supervisor, or both.

Other Policy Items

To be considered also, in writing personnel policies, are such items as work hours and work schedules. These are dealt with in Chapter III. An important consideration is the Employee General Orders, or a manual of directions for all non-instructional jobs. This is explained in detail in Chapter III, together with in-service training programs.

Supervision

Labor is a more important element than materials and supplies in school plant maintenance and operation, and if efficiency is to be secured in these related fields of service, there must be an adequate number of people employed to render the standards of performance desired by the school authorities. They must be competent, properly supervised, and provided with appropriate tools, equipment, and supplies. It is highly important that persons selected should have the potential to become proficient with short experience and with only occasional supervision.

Nature of Supervision

The superior has subordinates because he is responsible for more work than he can do himself. Consequently, his job is to get help from his subordinates. His job is people, not production. To do his job well, he must create conditions such that he gets effective assistance from his subordinates.[6]

Experience shows, of course, that good supervision is as helpful to non-instructional personnel as it is to the teaching staff. Output, quality of work, work methods, and morale can be improved by proper supervision of personnel.[7]

Elements of Supervision

There are two basic elements in the supervision of people--motivation and criticism.[8]

The only way to be sure of your effectiveness as a critic is to measure your performance by the rules in which you believe. When you must criticize an employee, ask yourself these questions:

1. Do I focus on the act instead of on the person?
2. Do I pick the proper place and time?
3. Is my judgment justified, based on a realistic appraisal of the facts?
4. Will my comments be specific, and will they do justice to the truth?
5. Do I have a remedy to suggest?
6. Will the long-range relationship with the employee remain unimpaired?

Lines of Authority

In the supervision of employees, it is well to emphasize the importance of lines of authority--a definite understanding on the part of each employee as to whom he is responsible, and over which personnel he may have supervisory control. The method of preparing a chart of "control centers" is shown in Chapter III. This means proper communication and must be spelled out in the written policies.

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[6] Mason Haire, Psychology in Management, (New York: McGraw-Hill Book Company, Inc., 1956), p. 52.

[7] A. D. Brainard, "Good Supervision Means Good Maintenance," Nation's Schools, September, 1956, p. 88.

[8] "Don't Be Afraid to Criticize," Supervisory Management, American Management Association, 1515 Broadway, New York 36, New York, January, 1960, p. 27.

Employers "Bill of Rights"

Employees have rights and privileges and so do employers. It may be pertinent from time to time to call employees' attention to their responsibilities to the school district. Such notices might be posted on employees' bulletin boards or inserted in pay envelopes, bearing brief communications as to:

Your Time; Job Attention; Job Improvement; Cooperation; Safety and Health; Communications, and other reminders.

Summary

The school superintendent's most important job is selecting and motivating people. He best performs this function through written personnel policies. He is responsible for writing these policies, getting them adopted by the school board, implementing and continuously revising the policies as may be needed.

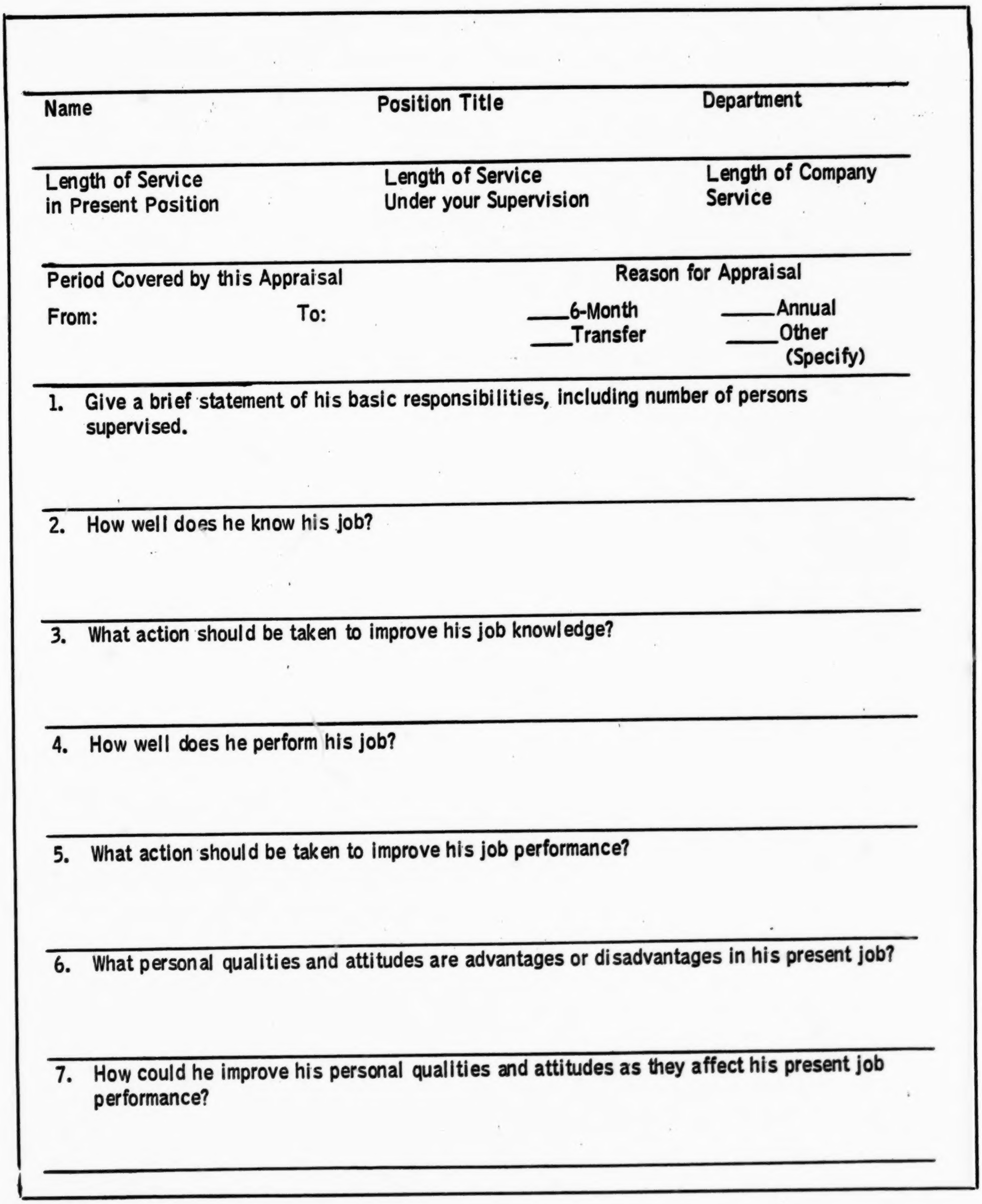
The state of personnel management floats or sinks on how much sense employees can make out of the policies which govern them.

Some policy considerations are: Hiring, Probationary period, Work hours, Tenure, Salary, Termination procedures, Absences, and Welfare provisions. Also important are physical condition, intelligence, attitude, education, ability, personal appearance, and habits of work, and conduct.

Salary policies should include a basic minimum wage for each position in a classified order, increments based on tenure and on the employee's value to the system.

Proper supervision is important to the successful management of personnel. Quantity and quality of work, work methods, and morale can be enhanced by proper supervision.

There are two basic elements in supervising people--motivation and criticism. Both must be handled with finesse to achieve a strong organization.



Name

Position Title

Department

Length of Service in Present Position

Length of Service Under your Supervision

Length of Company Service

Period Covered by this Appraisal

From:

To:

Reason for Appraisal

____6-Month

____Annual

____Transfer

____Other (Specify)

1. Give a brief statement of his basic responsibilities, including number of persons supervised.
2. How well does he know his job?
3. What action should be taken to improve his job knowledge?
4. How well does he perform his job?
5. What action should be taken to improve his job performance?
6. What personal qualities and attitudes are advantages or disadvantages in his present job?
7. How could he improve his personal qualities and attitudes as they affect his present job performance?

Maintenance Supervisory Personnel Appraisal Form

Figure 4.

Suggested Reading

"A Sound Staff Evaluation Program," *The American School Board Journal*, July, 1960, p. 15. Proposes some practical guidelines for evaluation of the school non-instructional staff.

Brainard, A. D., "Good Supervision Means Good Maintenance," *The Nation's Schools*, September, 1956, p. 88. Emphasizes the role of management in the maintenance function.

"Developing Certified Personnel Policies," *American School Board Journal*, November, 1959, pp. 15-17. Discusses basic elements of programming for personnel management.

"Don't Be Afraid to Criticize," *Supervisory Management*, American Management Association, 1515 Broadway, New York, New York, January, 1960, p. 27. Tells how and why to criticize employees, an important management area.

Drucker, Peter F., *The Practice of Management*, Harper Bros., New York, 1954. Suggests that *fear* be replaced with responsibility--a new and stimulating concept in personnel management.

Haire, Mason, *Psychology in Management*, McGraw-Hill Book Company, Inc., New York, 1956. Presents a set of principles and their implications for certain problems of industrial management.

Linn, Henry H., "Personnel Policies for Nonprofessional Employees," *Nation's Schools*, August, 1955, pp. 82-90. Contains a concise statement of principles for policy making.

Mikel, Frank J., "The Key to Motivation," *Personnel*, American Management Association, Nov.-Dec., 1959, pp. 70-74. Points out that management must act to restore some intrinsic meaning to work itself.

"New Patterns in Educational Staffing," *Overview*, November, 1960, pp. 52-55. Gives a brief treatment of modern staffing trends in large and small schools.

Phay, John E., "Custodial Personnel Administration," *American School Board Journal*, Series: March, April, May, June, July and August, 1948. Provides a set of principles governing many phases of school plant personnel management.

Skandera, Michael, "A Program for Custodial Selection," *American School Board Journal*, August, 1957, p. 41. Suggests practical policies for custodial staffing.

United States Civil Service Commission, *Basic Training Course in Position Classification*, (Personnel Methods Series No. II), Superintendent of Documents, Washington 25, D. C., 1961.. Includes four pamphlets dealing with fundamentals of the classification process as employed by the United States government. Importantly adaptable to the use of large public school systems.

Yeager, William A., *Administration of the Non-instructional Personnel and Services*. Harper and Brothers, New York, 1959. Examines the entire field of non-instructional personnel management.

Zachrich, A. N., "How to Develop a Sound Salary Schedule for Non-professional Personnel," *School Management*, September, 1959, pp. 50-54. Reports a step-by-step account of how one district developed a sound salary schedule for its custodial, maintenance, and operating staff.

CHAPTER III

CUSTODIAL SERVICES

In the maintenance and operation of a school plant, custodial services occupy an important position. School plant management realizes the value to the educational program of clean, well-kept buildings and grounds.

The work of management as related to custodial services includes personnel management--selecting, motivating, supervising, and training of employees, and the exercise of functional control of the program by means of work standards, work schedules, and budgeting for operation. Personnel management is discussed in Chapter II. This chapter will consider the management aspects of services rendered by school custodians.

The Role of Professional Custodianship

The school custodian of today is a professional employee. His job is complex, and his training approximates that received by his peers in industrial fields. The contemporary school workman reads his trade publications, he attends staff conferences and training workshops, he belongs to the Teacher Retirement System, has tenure status, and is allowed sick leave and other benefits. In some schools, the custodian's work is appreciated by increased emoluments; in others he is honored at banquets. He is no longer regarded as a menial laborer but is respected for the valuable service he performs in protecting the community's investment in school buildings and equipment.

The Custodian and the School Program

The services custodians provide contribute to the entire educational program by improving the physical environment. Sanitary, well-lighted, well-heated and well-ventilated buildings, clean classrooms, locker rooms, showers and food faciiities provide a wholesome atmosphere.

A good custodian knows every nook and cranny of his building or area. He is familiar with floor plans and placement of furniture, the location of all valves, outlets, lines, and mechanical operations. In this respect, he contributes to the economy of operation and the safety of the plant.

The good workman makes a scientific approach to his job in order to do it well. He knows the effects of the various chemicals in the products he uses, the proper use and care of mechanical equipment, a knowledge of the principles of heating, lighting, and ventilation, plus a galaxy of skills needed in the routine upkeep of the school plant.

A modern custodian has an appreciation of beauty and cleanliness, and people can point with pride to their school as the beauty spot of the community. This implies a knowledge of landscaping, gardening, and lawn care on the part of the custodian.

Aid to Teaching Staff

The custodian gives aid in many ways to the professional school staff, in arranging, moving, special favors, etc. He even helps with discipline problems, guiding and counseling young people, and giving them an appreciation of neatness, cleanliness, order, and economy. He is a valuable public relations asset, for he interprets the school to the community.

Custodial Status

The professional school staff should recognize the custodian in terms of his real contribution to the educational program. He is present not merely to keep the buildings warm, to sweep, clean, and do odd jobs on call, as many school personnel see his job. What he does has a definite relationship to the process of assisting children to learn, to keeping staff morale high, and to helping maintain good public relations.

Every effort to involve custodial help in planning, to grant adequate responsibility and authority, and to indicate to the other staff members their real dependence on the work of the custodial force will do much to establish the custodian in his proper status as an inportant member of the school staff.

Organizing the Custodial Program

Administrative responsibility for the management of custodial services lies essentially in organizing the program, selecting personnel, and supervising the operation. In the organization of the custodial program, the administrator would do well to operate from policies approved by the school board which outline the major features of the custodial program.

School Board Policies

School board policies concerning custodial services might include some of the following items:

1. Qualifications of a school custodian
2. Selection criteria, and employment procedures
3. Terms of contract and dismissal procedure
4. Salary, promotion, and benefits
5. Lines of authority and responsibility
6. Standards of performance and conduct
7. In-service training

(Non-professional personnel policies are discussed in detail in Chapter II.)

Qualifications for Custodians

Details on qualifications for custodians may be included in the official board policies, or incorporated into a custodial manual.

A school custodian should:

1. Be physically able to do his work. There should be no physical defects that prevent full attention to duty, no chronic illness. He should be able to pass a yearly physical examination.

2. Be of good character. He should not be addicted to drugs or alcohol, nor given to indecent language, nor slovenly in appearance or habits.

3. Be mentally alert. He should be able to read and report with understanding, able to keep records, to make inventories, inspection reports, etc.

4. Be dependable. He should be prompt in reporting for duty and always see that his job is done. He should always be on hand when needed.

5. Be able to get along with people. He serves students, teachers, administrators, and visitors. This involves tact, a sense of humor, an even temper, a pleasant voice, good judgment, courtesy, and an understanding and appreciation of children.

6. Be willing to grow in his job. He must want to work and be willing to assume responsibility. He devotes all of his working hours to his job and tries to learn to improve his techniques. He takes advantage of custodial workshops and meetings that may improve his efficiency. He is friendly with other staff members, takes directions seriously and is not averse to emergency requests for overtime work.

7. Be orderly. He understands order and neatness, how to care for tools, and how to follow a work schedule. He carefully budgets his time.

8. Be economical. He understands the value of the materials and equipment with which he works. He guards against waste of materials and utilities. He does not attempt to perform a task about which he knows nothing.

Responsibilities of Custodians

The custodian is responsible for the condition of the building, the grounds, and the equipment. He must be a jack-of-all-trades, alert for occasional emergencies. His general duties are centered about the following areas:

1. The general safety, health, and comfort of pupils and teachers.

2. The condition of the building and its equipment, and the site with its equipment.

3. The cleanliness of the building and grounds and the orderliness of all equipment and apparatus.

4. The sanitation of that portion of the plant for which he is responsible.

5. Fire safety.

6. The operation of service systems including heating, ventilating, water, and sewage.

7. The proper storage of materials and supplies.

8. The prevention of damage by water, wear, and abuse.

9. The keeping of records relative to his job.

Number of Custodians Needed

In determining how many custodians shall be employed, the school administrator is faced by a concrete determining factor. How many can he afford? There are yardsticks for solving the question of the number of custodians needed, but the budget is the deciding factor. Also to be considered is the quality of work desired by the community--first class, average, fair, or poor.

How many custodians do you need? Fernalld has answered this question by suggesting the following yardsticks: (1) Square feet--10,000 to 20,000 per custodian; (2) Rooms--8 to 12 per custodian; (3) Teachers--5 to 14 per custodian; (4) Pupils--125 to 300 per custodian.[1]

Linn has suggested 14,000 square feet of floor space as the maximum that one custodian can adequately care for,[2] while Viles offers that ten classrooms, plus the necessary additional spaces, is standard for any one custodian.[3] The National Education Association proposes that there be one full-time custodian for approximately 16,000 square feet of floor space.[4]

Local conditions may cause some variations from these suggested standards.

In Alvin, Texas, Independent School District the amount of area handled by a custodian is proportioned on a point basis, as follows: Classrooms, 10 points; large, full-sized toilet, 20; office 4; teacher's lounge, 3; hall (serving 8-10 classrooms), 5; one flight of stairs, 3; assembly room used daily, 30 to 50, depending on size; used periodically, 15 to 30. The custodial work load is 200 points, with a ten point deviation either way allowed. A typical Alvin custodian, "Mrs. X" has 11 classrooms, 3 rest rooms, 1-3/4 halls, 2 offices and 1 teachers' lounge, totaling 190 points.[5]

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[1] "How Many Custodians Do You Need?" School Management, October, 1958, pp. 62-68.

[2] H. H. Linn, The School Custodian's Housekeeping Handbook, (Bureau of Publications. New York: Teachers College, Columbia University, 1948), p. 51.

[3] N. E. Viles, The Custodian at Work, (New York: The University Publishing Company, 1941), p. 44.

[4] National Education Association, Proposals for Education in Postwar America (Washington, D. C.: 1944), pp. 17-21.

[5] J. D. Engman (ed.), A Survey of Selected Gulf Coast Schools, 1961.

It is suggested that the administrator look at the practical situation--not how much a custodian is supposed to be able to do, but how much he can do, without undue strain, in a normal work day or week, with adequate tools and supplies. All buildings (and all human beings) are constructed differently, and are almost impossible to equate with any given formula.

The Custodian's Handbook

A valuable management technique in organizing the custodial program is the use of a concise statement of rules, regulations, and procedures incorporated into an operating manual or custodian's handbook. Definite improvement in the custodian's work and in his occupational relations has been observed where the custodian has use of a manual of instructions, including a statement of responsibilities, in order that he may know at all times what must be done to keep the physical plant well-groomed in appearance and to maintain good public relations.[6]

An outline for such a publication is offered below:

I. The School Custodian in the Performance of His Tasks

   A. What a school is

      1. Staff people are involved
      2. How good is our school system
      3. Investments must be protected

   B. What qualifications the custodian should possess

      1. Physical
      2. Educational
      3. Moral

   C. The responsibilities of a school custodian

      1. Work hours
      2. Work areas
      3. Tools and equipment
      4. Services to teachers and students

   D. Influential role in public relations

      1. Relationship with other personnel
      2. Relationship with the building principal
      3. Relationship with the public

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[6] Arthur L. Newell, "The Custodial Handbook," American School Board Journal, August, 1960, p. 27.

E. Community use of schools

   1. Personal appearance and attitude
   2. Understanding of board policies

F. The need for written work schedule

   1. Definite duties
   2. Definite hours

G. Purchasing policies

   1. Understanding of budgetary requirements
   2. Preparation of requisitions

H. Custodial inventory

   1. Preparation of semiannual(or annual) inventory
   2. Need for keeping perpetual inventory

I. In-service training program

   1. The need for occupational growth
   2. Evaluation of current procedures

J. Evaluation of custodial services

   1. Looking at ourselves
   2. Improving custodial relations
   3. Improving safety and health standards

II. School Plant Housekeeping and Maintenance

A. Preventive maintenance

   1. Maintenance and depreciation
   2. Long-range planning
   3. Importance of periodic inspections

B. Maintenance of floors

   1. Protection against wear
   2. Properties of good floor coating

C. Concrete floors

   1. Composition
   2. Maintenance instructions

D. Terrazzo floors

   1. Composition
   2. Maintenance instructions

E. Resilient tile (Asphalt, Rubber, Vinyl) floors

    1. Composition
    2. Maintenance instructions

F. Wood floors

    1. Composition
    2. Maintenance instructions

G. Care of toilet rooms

H. Plumbing care responsibilities

I. Care of electrical equipment

J. Care of heating and ventilating systems

K. Care and cleaning of chalkboards

L. Care of grounds

    1. Cleaning schoolyard
    2. Care of lawn and landscaping
    3. Care of walks and driveways
    4. Care of playground equipment

III. Safety in School Plant Operation

A. Safety and health practices

B. Fire safety equipment

IV. Appendix (forms used in plant operation)

A. Checklist for custodial services

B. Rules and regulations for use of school facilities

C. Permit for use of school buildings

D. Requests for maintenance repairs

E. Summer work order

F. Inventory record--equipment and supplies

The Custodian at Work

The work of a school custodian centers about two major areas, housekeeping and school plant maintenance. There is considerable overlapping of duties in these areas, so the distinction is not well established. One synchronizes with the other in much of the work done by a good custodian.

Housekeeping contributes to cleanliness while maintenance is concerned with conditioning. Both contribute to the school environment and to the attitudes of teachers, students, and taxpayers. When a custodian keeps a floor free of dirt, sand, and water, he cuts down the cost of repair or replacement of the floor, and at the same time contributes to the aesthetic atmosphere.

Custodial Work Schedules

The school plant manager will find it difficult to apply rules when setting up custodial work schedules and equalizing the work load in a system where two or more custodians are employed. To assign an equal number of rooms to several custodians does not necessarily balance their work loads. The same may be said of assigning each custodian so many square feet, or a given number of pupils or teachers. Some rooms get dirtier than others, some have adjoining toilets, some are equipped with special furniture and equipment--these and other factors tend to break down certain measurements used in assigning custodial duties.

The best type of work schedule, for one custodian or several, would be based on standards of time and the quality of housekeeping to be maintained.[7]

In preparing a work schedule, the first step is to list all the duties that are to be performed daily, weekly, monthly, and seasonally by the custodian. The second step is to set up time requirements for the tasks to be done. The third step is to list the time of day when it is best to perform each job. Lists should also be made of work to be accomplished during the winter and summer vacation periods. It becomes the job of plant management to break these lists down into equal loads for the custodians, and see that work requiring special talent is given to those having the training to perform those duties.

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[7] "Mr. Custodian," A Handbook for School Administrators and Custodians (Des Moines, Iowa: Department of Public Instruction, 1960), p. 12.

A schedule of custodial duties is not intended to limit the good judgment or ambitions of the personnel concerned. It should be a general rule and guide to the performance of such tasks as are necessary to have a well-groomed plant. The custodial handbook outlined earlier might contain the following details:

A. General Duties

1. The work week (5 days, 40-45 hours recommended)
2. Holidays, school
3. Vacations, summer
4. Evening duties, if any
5. Reports to principal (or head custodian)
6. Absences--leaves or sickness
7. Exceptions, as deemed wise by proper authority

B. Daily Duties

1. Check of heating system each morning to assure proper room temperatures by 8:15 A.M.
2. Loose books, clothing, and trivia to be gathered and properly handled at day's close
3. Corridors near entrances to be mopped on wet days after all students are in
4. Empty all waste receptacles and burn trash
5. Take care of cafeteria garbage, if need be
6. Clean and mop all washrooms and fixtures
7. Sweep all classrooms, halls, and offices
8. Raise and lower school flag, if so appointed
9. Clean grounds adjacent to buildings of waste paper, trash
10. Dry mop corridors after lunch period
11. Check restrooms mid-morning, noon, and mid-afternoons for sanitation
12. Other duties as may become necessary

C. Weekly Duties

1. Buff waxed corridors, rewaxing where necessary
2. Dust all "dust catcher" areas
3. Lubricate all operating machinery
4. Weekly inspection of building and grounds, reporting on proper forms
5. Anticipate any forthcoming holidays
6. Check with supervisor on weekly evening schedule

D. Unscheduled Duties

1. Check in freight, parcel post shipments
2. Replacing glass, light bulbs, pencil sharpeners, etc.
3. Minor plumbing, electrical repairs
4. Minor repairs to furniture, shades, venetian blinds

5. Cleaning, straightening up custodial spaces
6. Cleaning, washing, combing mops for next day's work
7. Mowing lawn, working flower beds, shrubs
8. Locking, unlocking spaces
9. Spraying for flies, insects
10. Moving furniture, equipment, as needed
11. Emergency calls

E. Monthly Duties

1. Clean light fixtures in classrooms and corridors
2. Clean oil burners in furnaces
3. Clean and vacuum lounge furniture
4. Air sickroom mattresses

F. Vacation Duties

1. Christmas
    a) Wash, rewax classroom floors
    b) Wash all windows
    c) Vacuum auditorium curtains and drapes
    d) Blow down boilers
2. Summer
    a) Recondition wood floors
    b) Wash windows (late summer)
    c) Clean out heating equipment
    d) Clean, paint courts, redress gym floor
    e) Repair, recondition desks and chairs, planing, sanding and painting, varnishing
    f) Wash all interior walls
    g) Touch up painting, where necessary

Custodial Tools and Equipment

This subject is treated in detail in Chapter VI.

Women as Custodians

Schools in the Texas Gulf Coast area report good results from the employment of female custodians, of forty-nine answers to a 1961 survey, 30 schools indicated that women were employed for custodial help, in amounts ranging from 10% to 75% of the custodial staff.

Alvin, Texas, Independent School District has over 75% of its custodial work done by women--older women, preferably widows, who have worked elsewhere and know how to meet the public--women who need the work, want to work, and know what a clean house is. General practice in Alvin is to let these women have one or two hours off during the day to compensate for early arrival at school.[8]

In-Service Training for Custodians

An in-service training program for custodial employees is essential for the efficient operation of a school plant management program. The rapid changes occurring today in methods, evolving from advances in science and technology, plus the steady improvement of various products and equipment, make it imperative to hold frequent workshops and training classes for maintenance and operation employees to help them keep abreast of modern developments in their field.

Scope of the Program

Under the direction of Mr. Jarvis Barnes, Assistant Superintendent of Schools, Atlanta, Georgia, a survey has been made of the scope and general character of custodian in-service training conducted in twenty-five major southern city school systems.[9]

The following characteristics were found:

1. The beginning custodian is assigned for at least one full year to work under the direction of a good, experienced custodian, and is required to take the in-service course for custodians.

2. The instructors for the in-service training are, for the most part, custodial supervisors of the local district aided by outside specialists as consultants.

3. The course is conducted during the school year, and ranges from thirty to fifty hours of practical study. Typical arrangement is twenty to twenty-five weekly two-hour sessions.

4. No previous experience is required of beginners; however, during the first (probationary) year, he is required to pass the prescribed course.

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[8] J. D. Engman (ed.), A Survey of Selected Gulf Coast Schools, 1961.

[9] "Survey of In-Service Custodial Training," American School Board Journal, July, 1959, p. 37.

5. Refresher courses (or examinations) may be given as a basis for promotions.

6. The custodial trainee is given a "text," a handbook outlining school policies and custodial techniques.

7. In most cases, the school vocational department provides the classroom space for conducting the course.

Aims and Objectives

A well-planned training program for custodians improves their knowledge and skills, leads to a higher interest in the work, contributes to a more professional attitude and better morale.

The objectives of an in-service training program for custodians are:

1. To reduce operation and maintenance costs.

2. To raise the standards of building-grounds maintenance.

3. To improve the quality of custodial performance.

4. To reduce the administrator's problems.

5. To improve the over-all educational program.

Organizing the Workshop

Following are some suggestions for organizing a custodial training workshop:

1. Obtain authorization from school board for program, and for financial support.

2. Keep all parts of the program practical; custodians are practical people.

3. Invite competent people from outside the system as consultants and instructors.

4. Make provision for visual aids and practical demonstrations.

5. Use a "kick-off" approach, with some person outstanding in the field, who will give an overview of the importance of the custodian and his work in implementing the educational program.

6. Invite supervisory personnel to attend, that they might further understand what they must supervise. This includes principals, business manager, etc.

Workshop Methods

The custodial training course proceeds by means of practical demonstrations, visual aids (movies and film strips), informal lectures, question and answer periods, and group discussions. A good management device is to award certificates of completion for those taking the course. Also recommended is a publication of the workshop proceedings, including pictures of the group attending and the names of all participants.

Workshop Content

The following list is not meant to be either inclusive or exclusive, but merely presents suggested subject matter for a custodial training course:

Air conditioning, heating, and ventilating
Blackboards, cleaning and resurfacing of
Boiler room operation and maintenance
Cleaners and disinfectants, use of
Clock, bell, and alarm systems
Electricity, A B C's of
Exterior surfaces of buildings
Fire fighting, methods and handling of apparatus
Floors, reconditioning of
Floors, cleaning of
Furniture, refinishing and repair of
Grounds care
Hardware
Housekeeping
Lighting
Paints, types of
Personal appearance and conduct
Record keeping
Responsibilities of custodians
School safety
School law
School philosophy
State equipment
Storage spaces
Temperature controls
Toilet room cleaning
Tools, proper use and care of
Valves, all types
Waste disposal
Window cleaning
Workloads

Summary

The work of school plant management relating to custodial services includes personnel management and functional control of the labor force.

The modern school custodian is no longer a menial laborer but a respected member of a professional team. His work contributes to the economy of operation, to the safety of the plant and its personnel, and to the enhancement of the over-all school program.

School board policies should outline the major features of the program of custodial services, including qualifications, responsibilities and duties of custodians.

Yardsticks for determining how many custodians are needed are suggested, but the administrator is advised that it is difficult to apply such standards in any given local situation, and a practical, local approach is suggested.

School board policies can be translated and detailed in a custodial handbook or manual for procedure. An outline for such a publication is included in this chapter.

The duties of the school custodian center about two major areas, housekeeping and maintenance. These areas are synchronized in actual practice.

Custodial work loads are difficult to equate on any basis other than time standards and on the quality of housekeeping desired.

Making work schedules involves (1) listing all duties to be performed, (2) setting up time requirements for the tasks to be done, and (3) deciding the time of day (or month, or season) when it is best to do each job. Management then breaks this information down into equal custodial work loads and assigns personnel as to their special skills.

Custodians have daily, weekly, monthly, and seasonal schedules of duties.

Many schools employ women as custodians, older women, who want to work and who understand good housekeeping.

A program of in-service training for custodians is essential for the efficient operation of a school plant. Details are given as to the objectives of in-service training and how to organize and implement a custodial training program.

Suggested Readings

American Association of School Administrators, *School Plant Maintenance*, 1951 Yearbook, The Association, Washington, D. C. Covers all areas of the maintenance program. A valuable reference source.

George, N. L., *School Custodian Training Manual*, The University of Houston Bookstore, Houston 4, Texas, 1961. Reports the details of a course in custodial training conducted by the author, a recognized expert in the field.

Grossnick, G. E., "In-Service Custodian Training," *American School Board Journal*, May, 1959, pp. 45-47. Details a comprehensive plan for organizing and implementing a custodian training program.

"How Many Custodians Do You Need?" *School Management*, October, 1958, pp. 62-68. Furnishes practical yardsticks by which to determine how many custodians are adequate for good housekeeping.

Linn, Henry H., and others, *The School Custodian's Housekeeping Handbook*, Bureau of Publications, Teachers College, Columbia University, New York, 1948. Covers the scope of housekeeping chores still pertinent to the modern custodian.

Mase, Wayne E., *A Self-Rating Scale for School Custodians*, Emporia State Teachers College, Emporia, Kansas, 1954. Presents an interesting and novel checklist whereby custodians can objectively evaluate their work.

"Mr. Custodian," A Handbook for School Administrators and Custodians, Department of Public Instruction, State of Iowa, Des Moines, 1960. Provides general information on the custodian's qualifications and duties in regard to school plant maintenance and operation.

National Education Association, *Proposals for Education in Postwar America*, Washington, D. C., 1944, pp. 17-21. Reports the findings and recommendations of a national planning conference.

Newell, Arthur L., "The Custodial Handbook," *American School Board Journal*, August, 1960, p. 27. Lists the details of planning a manual of procedure for school custodians.

Operation Manual, Oklahoma City Public Schools, Maintenance Department, Oklahoma City, 1957. Serves as a concise and comprehensive guide for school custodial services.

Peters, Jon S., "Performing Selected Custodial Tasks," *American School Board Journal*, October, 1957. Gives some practical suggestions for custodial maintenance tasks.

"Survey of In-Service Custodial Training," *American School Board Journal*, July, 1959, p. 37. Reports the results of a national study of custodial in-service training programs.

The School Custodian as a Technician, Capital Area School Development Association, New York State College for Teachers, Albany, New York, 1957. Includes a series of illustrative studies of the impact of modern technological advances on school custodial services.

"Training Competent School Plant Staffs," Report of the Tenth Annual Custodial Workshop, The Western New York School Study Council, The University of Buffalo School of Education, Buffalo 14, New York, 1959. Presents a useful resource for those charged with the care and maintenance of school facilities.

Viles, N. E., *The Custodian at Work*, University Publishing Company, New York, 1941. Sets forth standards for school custodianship that are still pertinent today.

CHAPTER IV

OPERATIONAL MAINTENANCE

A modern school plant involves a considerable investment of public funds, and is generally designed not only for its functional aspects but also to attract and retain the interest and pride of every citizen. This community pride and respect for education is greatly enhanced if the plant operation and maintenance are carefully administered. In fact, the respect for education in any community may be in direct relationship to such administration. It is needless to say that major consideration should constantly be given to operation and maintenance so that this esteem on the part of school personnel and community may flourish.[1]

The chief responsibility of the administrator as to care of buildings and grounds is to operate and maintain the school plant and facilities so that a high level of efficiency in instruction may be achieved.

Linn lists the major responsibilities in the area of building-grounds maintenance as follows:

1. Preservation of the physical property which contains costly plant equipment. Equipment must be kept in good working condition at all times with immediate attention given to repairs and replacements as needed.

2. Preservation of the health of all who use the building and grounds through cleanliness, sanitation, proper heat, ventilation, humidity control, lighting, and other controls designed to maintain a healthful environment.

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[1] William A. Yeager, *School-Community Relations*, The Dryden Press, New York, 1951, pp. 74-83.

3. Maintenance of the safety of those who use the school plant, including prevention of fire hazards, disposal of faulty equipment, and prevention of accidents from any discernible cause.

4. Maintenance of standards of cleanliness and neatness such as would be found in any well-regulated home.

5. Proper maintenance of those aspects of the environment which are within the control of the department, such as the removal of irritations of any sort (noises, odors, etc.) and which in turn promote the happiness and well-being of building users.

6. Creation of good will through excellent service, courteous regard for all who use the building and desirable personal attitudes.

7. Effecting economies wherever possible in operation, maintenance and good workmanship.[2]

Supervision of Maintenance

The supervision of maintenance work in smaller school systems usually falls to the superintendent of schools. In larger districts this responsibility is delegated to specialists who carry a variety of titles such as building engineer, maintenance engineer, head custodian, supervisor of maintenance and operation, and superintendent of buildings and grounds. The school plant specialist might be titled superintendent of buildings and grounds, supervisor of buildings and grounds, or administrative assistant for buildings and grounds. Custodial personnel classifications should be stratified under such designations as head custodian, custodian and cleaner, or matron. (See Chapter II, on Personnel.)

Delegation of Responsibility

Since most superintendents of schools are overloaded with other administrative duties and most school principals are confronted with administrative and supervisory tasks involved in the instructional program, school administration can be improved by the assignment of school plant responsibilities to a qualified central staff member. In the larger school districts, a specialist may be employed who is trained and educated to (1) determine building needs and recommend solutions for them; (2) remove operational inefficiencies; (3) recruit and adequately train custodial and maintenance personnel, and (4) determine the weaknesses in the design of school plant facilities. This specialist in an advisory capacity should assist the school principal to administer the housekeeping of the building through a greater knowledge of the technical problems involved. After the details have been jointly considered, the program should rest in the hands of the school principal, for it is his building to administer. Any unresolved difference should be left to the superintendent of schools, who should be the final authority.

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[2] Henry H. Linn, School Business Administration (New York, The Ronald Press, 1956), pp. 385-389.

Organization and practice concerning the maintenance of school buildings and grounds will vary with the size of the enrollment. But all maintenance programs that are not on a hit-and-miss basis require the consideration of certain basic policies. Major policy areas are:

1. Ascertaining Needs. One question to be answered early is: Who should be responsible for ascertaining maintenance and improvement needs and determining their relative priority?

The principal's responsibility in determining maintenance needs should involve requests for routine repairs or items evident to a nontechnical person as being in need of repair. Repairs to mechanical equipment or items of preventive maintenance are not likely to be noted by the average school principal until a breakdown or damage occurs.

Lists of needed improvements should be set up, e.g., modernization of lighting, heating, and plumbing, acoustical treatment, development of grounds and playfields. They should be programmed for budget consideration and for completion as money is made available.

2. Importance of Needs. The determination of the relative importance of needs, particularly of improvements, should be reached on a democratic basis. The educational administrators concerned should have adequate opportunity to share in this determination. No building alterations, even minor, changing the use of instructional space, should be undertaken without the approval of the educational administrator locally concerned. In most cases the school board will want to pass on the broader aspects of planning, especially where improvement items are concerned.

3. Priorities. Priority must be given first to the proper maintenance of the exterior of the building: roofing, outside painting, waterproofing, pointing of masonry, and so forth. Neglect of the exterior in favor of desirable but deferrable interior items is like going to a pawnbroker for the money. The high cost will come in the rusting of metal, rotting of wood, and interior damage from leaking roofs or walls. Urgently needed mechanical repairs and corrections,

especially to the heating system, should be given priority recommended by the technical staff.

4. Inspection. Periodic inspection of the school plants should be made by persons of technical competence. Many school systems have developed checklists for this purpose, so that no essential item is overlooked (refer to Chapter XV for inspection checklists).

5. Control. A central office control record should be maintained for major items of recurring maintenance, such as interior painting and exterior painting of wood and metal. Cycles for frequency should be established but should be supplemented by physical inspection for possible variation of the cycle in regard to a given building.

6. Supervision. Regardless of the size of the system, whether the work is done by private contractor or the district's own forces, adequate supervision of the quality of work and materials is essential if the district is to get what it has ordered and full value for money spent.

7. Facilities. It would be difficult to achieve some of the economies and efficiencies mentioned without giving custodians the best tools and equipment to do their work. Tied in with this is adequate storage and work area. Most districts find it more economical to make outright purchases of tools and equipment that have a recurring usage. Pieces of equipment to be used once in a long time might better be rented.

8. Coordination of Labor Force. Generally, efficiency can be increased by greater integration and coordination of the maintenance and custodial forces. The custodial forces should be trained and encouraged to perform many simple maintenance jobs in the school.

9. Records. Adequate records should be kept on forms correlated with inspection reports to show when work is done, and other appropriate information. Proper inventories of equipment and supplies are essential. Forms for these data may be devised to suit the local school situation.

10. Budgeting. Budgeting should be based on need. A statement of requirements for maintenance should be prepared for consideration of the board when budgets are being prepared. Such needs might well be set up by categories: Lighting, heating, alterations, playground development, hard surfacing, exterior painting, interior painting, roofing, etc.

11. Research and Training. Not even the largest system has adequate staff to keep abreast of best practice in the field of maintenance. The overworked jack-of-all-trades in the small system has little opportunity to keep informed. Who is to tell him the proper primer to use over galvanized metal so that the labor and paint will not be wasted through peeling of paint? There is a wealth of information already in existence which, if made available for the use of the maintenance staff,

will greatly enhance the maintenance program. The Texas Education Agency Division of School Services is one such source; The U. S. Office of Education has numerous bulletins on operation and maintenance in schools, and school study groups, such as the Gulf School Research and Development Association at the University of Houston, have a wealth of material helpful to maintenance workers.

Maintenance Work

Miller and Spalding describe the detail in which a good maintenance program must be provided as follows:

> A good maintenance program provides for the tightening of each bolt as it becomes loose. It anticipates maintenance needs rather than waiting until deterioration or damage requires urgent replacement or repair. Such a program is also planned and scheduled. The initial maintenance plan may be established by a careful inspection of each interior space and of the exterior of each building. Survey sheets for the inspection may provide space for a report on the condition of the painting, walls and ceilings, floors, lighting fixtures and electrical system, plumbing fixtures, heating fixtures, windows and window shades, chalk boards and tack boards, furniture and other equipment. Attention needed should be noted on the survey sheets as immediate, within the near future, eventually, or no comment. When such information is collected along with information concerning the maintenance needs of exterior painting, waterproofing, repainting, roof repairs, gutters and rain spouts, and the like, it is possible to lay out a schedule of maintenance work to be accomplished over a period of years.
>
> Such a program will provide a regular schedule for interior and exterior painting. It will provide regular service to various pieces of school equipment. Through such planning the costs of maintenance can be leveled off from year to year, and the building will be kept in proper repair, every ready for the educational and community service expected from it.[3]

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[3] Van Miller and Willard B. Spalding, The Public Administration of American Schools (Yonkers-on-Hudson: World Book Company, 1952), p. 377.

Dr. N. E. Viles, an outstanding authority on the school plant, has listed the following as reasons for efficient, thorough, and continuous maintenance:

1. Provide and maintain safe conditions and environments for the children's well-being.

2. Maintain the school plant as an efficient educational tool, since maintenance contributes to educational convenience and facilitates the total program.

3. Preserve property values and retard deterioration, thus providing a factor of economy.[4]

Viles fails to include the public relations factor as an express objective of proper maintenance, but school administrators are well aware of the positive impression and public confidence resulting from well-maintained school property.

Basic Factors

The successful functioning of operational maintenance is dependent upon these basic factors: (1) An appropriate number of capable employees qualified in their respective lines of work; (2) competent supervision, especially at top levels, and (3) an adequate number of essential tools, equipment and supplies. Since all other aspects of maintenance depend upon operational maintenance, this becomes the most important question in the field of building maintenance.

Maintenance actually begins with the architect's primary plans of the school building. It has been proved through continuous practice that the design of the school building and the materials used therein determine the ease or difficulty of maintenance. Architects and school administrators with experience in designing school buildings have learned that initial cost of materials used in a building is not a true measure of the eventual cost involved. Experience and studies have proved that many so-called economies in building construction actually result in greater expense to the taxpayer due to greater maintenance and upkeep requirements. Maintenance costs can be greatly reduced through the selection of maintenance-free materials at a cost of slightly more than the cost of the so-called "economical" materials. Those responsible for the selection of building materials have begun to consider the cost of said materials after ten years of usage, rather than considering only the initial cost. Therefore, the factors now being used in cost evaluation are initial cost plus the cost of maintenance. One Gulf Coast school system is now constructing a senior high school consisting of materials none of which require painting.[5] This eliminates the greatest cost of maintenance; and this particular building had an initial cost no greater than the average for the area in which it is located. This is a development of much interest to Texas Gulf Coast school people.

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[4] N. E. Viles, "Maintaining and Replacing Schools," The American School Board Journal, July, 1959, p. 24.

A current trend in school building construction which greatly influences operational maintenance is climate control. Air conditioning reduces maintenance requirements because of the reduction in dust and moisture in the air, both of which contribute to the deterioration of materials. The elimination of these also reduces day-to-day housekeeping requirements.

The first prerequisite for a successful maintenance program is the selection of qualified and competent personnel. Linn states:

> Although instruction of children and youth is the predominant service rendered in schools and professional classroom teachers constitute the basic personnel involved, important supplementary or auxiliary services are rendered by non-professional employees. The successful performance of the non-instructional services will depend largely on the efficiency and effectiveness of the persons engaged and, to a lesser extent, on such material things as machinery, appliances, equipment, and supplies. A major problem confronting school administrators, then, is how to obtain and direct appropriate personnel for these several areas of service.[6]

In large city school systems, the personnel for maintenance includes a variety of craftsmen; carpenters, cabinetmakers, painters, glaziers, metalworkers, electricians, and others. In smaller systems, carpenters, electricians, and other repairmen are most commonly employed. In very small systems, the janitor or custodian does the usual repair work, and specialists are hired by the hour on the job for the more difficult duties. In most school systems, large and small, custodians do a large part of the minor repair work. (A list of these jobs appears on Page 52). Generally, the qualifications emphasized for the specialized maintenance personnel are expertness and diligence, with less attention to personal qualities than with the custodial employees.

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[5] The Spring Branch Independent School District, Houston, Texas.

[6] Henry H. Linn, "Maintenance and Operation Fundamentals," The Nation's Schools, November, 1958, p. 65.

CHECKLIST OF MINOR REPAIRS PERFORMED BY CUSTODIANS

- Replacing window glass.
- Tightening screws and bolts in furniture.
- Repairing window shades.
- Replacing venetian blind cords and slats.
- Replacing electric fuses.
- Replacing electric light switches.
- Replacing electric light sockets and fixtures.
- Repair or replace parts to motors.
- Tightening loose door knobs.
- Replacing door knobs.
- Adjusting door checks.
- Cleaning and adjusting gas stoves.
- Replacing washers in valves.
- Regulating flow of drinking fountains.
- Replacing flushing mechanism in water closet toilets.
- Replacing furnace grates or burners.
- Cleaning traps.
- General painting and touch-up work.
- Varnishing woodwork.
- Refinishing furniture.
- Repairing playground equipment.
- Sharpening and repairing tools.
- Cleaning clogged drains.
- Repairing pencil sharpeners.
- Repair and installation of hardware.
- Repair fire escapes.
- Repair or replace bell wiring.
- Others as assigned.

Source: N. L. George, *School Custodian Training Manual*,
University of Houston, College of Education,
1961, p. 144.

Deterioration of Plant

School buildings are not like the "one hoss shay." They do not go to pieces all at once. Deterioration of schools is one of degree:

1. The exposed exterior surfaces of the skin of the building may give way much sooner than other parts.

2. In most buildings, mechanical systems, including the wiring, lighting, heating, plumbing, etc., may need parts and overhauling once or more during the practical life of the building.

3. The skeleton, or framework, including the foundations, major walls, etc., of a good building may last for 100 years or more.

4. The rate of deterioration will vary with the type of construction, the types of materials used, the types of surfaces, the use made of the building, climatic conditions, and the quality of the maintenance that has been carried on.

Failure of maintenance to keep pace with deterioration makes rehabilitation necessary--at vastly greater cost.

Maintenance Methods

Numerous plans for the accomplishment of maintenance have been and are being used. Most of the plans can be categorized as follows:

1. All maintenance work done by a school staff which includes custodians and a professional maintenance crew composed of one or more journeymen.

2. All maintenance work done by contract. Contracts may be on annual basis or may be for specific job.

3. Maintenance work done partly by a school staff and partly by contract.

4. Most work done by school staff except occasionally journeymen are called in for specific jobs.

There is considerable disagreement about which plan is the best, but it is generally agreed that a combination of school staff people plus occasional contract work is feasible. It would not be practical for the average school system to maintain specialized personnel competent to perform all types of jobs which arise. McEwen has analyzed the pros and cons and suggested in conclusion:

In weighing advantages and disadvantages in the use of school staff, we must be mindful of the sum total of all the experiences contributing to the employment of such staff in the beginning. Concerns probably developed around failure to get services when required, repeated calls to correct the same trouble, use of inferior materials, and lack of staff competence to pass on the acceptability of a completed job. These concerns are still with us and we know that items affecting operation require immediate attention and must be dealt with forthrightly. As long as the maintenance responsibility is ours, we may deem it necessary to surround ourselves with a staff sufficient for the job. So if some of the pro and con statements herein appear slanted, they are.

Advantages in use of maintenance staff include:

(1) Usually the hourly rates of full-time personnel of the types used in school maintenance are slightly lower than the prevailing wages paid by contractors, thus giving the school a cost advantage.

(2) School staff may be dispatched more readily to trouble spots in the order of the importance to operation.

(3) The nature of many maintenance jobs defies description and often require adjustment or redirection after work is under-way. A school-employed staff may be 'change-ordered' without waiting for the next board meeting. An all inclusive blanket specification covering parts replacement where needed invites added costs.

(4) School staff members have a familiarity with plant that enables them to proceed directly to assignments without loss of time. Frequently trouble can be diagnosed in advance and staff may be supplied with parts and tools and required to restore operation with dispatch.

(5) All school communities do not provide competition in the type of services required in school maintenance, thus denying the school districts the safeguard of competitive bids.

(6) The esprit de corps of a school-employed staff, which takes pride in smooth operation, cannot be underestimated as a point favoring use of school employees.

Disadvantages in use of maintenance staff include:

(1) Providing staff in sufficient quantities and qualities can result in expensive stand-by force which encourages supervisors to assign personnel to 'busy-work' in inconsequential tasks.

(2) Widely dispersed schools, as found in a county system, require excessive travel for centralized maintenance staff that might be obviated by use of contractors more advantageously located.

(3) It is impracticable in smaller systems to employ properly trained personnel for all the different types of maintenance.

(4) Multiple breakdowns widely dispersed would overtax a balanced maintenance crew.

(5) Work of a 'jack-of-all-trades' may be inferior to the quality of contracted work.

Experience reveals that the processes required in contracting consume considerable time. For this reason jobs recognized in a long-range maintenance program and certain annual tasks lend themselves more readily to contracting than do others. Also, it isn't difficult to prepare in advance maintenance contracts on specifics; such as, office equipment or visual and sound equipment. But when it comes to trying to cover every eventuality, you cease to be practical.

Replacing the roof on a building or making general repairs to large roof areas on several buildings, where reliable firms will submit competitive bids on bonded roofs, may be contracted advantageously. If minor repairs are needed, such as, flashing leaks or damage to gutters and downspouts, competence to repair may be provided in maintenance staff.

The painting and plastering either outside or inside school buildings, specifically of total buildings or large portions thereof, may well be contracted and completed during the summer months. In medium to large systems, this type maintenance represents a tremendous

> number of manhours and, if done by school staff, would have to be a continuous year-around program which of necessity would cause inconvenience to or interruption of the instructional program. The school painters can be profitably employed in following carpenters in the installation and repair of new partitions, doors, or windows and touchup of areas receiving excessive usage.
>
> Maintenance of schedule clocks, fire alarm systems, manual and electric typewriters, office machines, elevators, and visual and sound equipment requires a variety of highly technical skills and may be conveniently maintained by contract. Satisfaction with the contract method is contingent on availability in the community of adequate and dependable servicing contractors. Such maintenance performed by the school staff would require the addition of a special shop, equipment, and a corps of skilled workers.
>
> Rehabilitation of buildings or large parts of buildings, including such major items as replacement of foundations, walls, partitions, electrical circuits, heating systems, etc., would be difficult to schedule with a balanced school staff, and hence could best be handled by contract. On the other hand, rehabilitation work in a limited amount could be reasonably handled by maintenance staff.
>
> By leaving the larger jobs and the jobs requiring highly specialized skills to contractors, you do much to appease the free enterprisers and, at the same time retain the flexibility desired through use of a limited and balanced maintenance staff.[7]

Several school systems have extended custodial service to include a portion of that done under contract by a professional and commercial custodial firm. Since most of the work done by the commercial firm is accomplished during the evening hours, one or two regular school custodians are kept on duty in order to accomplish the operational maintenance work expected of custodians and to take care of emergency cleaning requirements.

Such a plan has been used by the Spring Branch Independent School District, Houston, Texas, for the past two years and has been found extremely satisfactory. The Pleasant Valley School District, Camarillo, California, has also made use of this type of plan to great satisfaction. Former superintendent of schools of Pleasant Valley, Gerald W. Brekke, sets out advantages for the dual custodial plan as follows:

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[7] Fred McEwen, "Contracts Versus School Maintenance Staff," The American School Board Journal, December, 1957, pp. 43-44.

1. Recruiting, training and supervision of custodians has been virtually eliminated.

2. Finding full time employment for a full school staff during the summer months no longer is a problem.

3. Economies are realized because the contractor furnishes his own cleaning equipment, materials, and supplies.

4. Cleaning efficiency has been improved.

5. Administrative and clerical time has been reduced.

6. Budget estimating can be done more scientifically.

7. Cost of custodial service was reduced by 28 per cent.[8]

Another plan for operational maintenance is a rotating custodial crew which performs those tasks generally classified as periodic, such as floor cleaning and waxing. It is claimed that more specialization can be gained from such a plan, and the relief on regular building custodians produces more efficient day-to-day housekeeping.[9]

Principles of Maintenance

Regardless of the plan used, there are several principles which must be applied in order to keep an efficient system of operational maintenance.

1. Periodic surveys and inspections must be made. An engineering firm should make an annual inspection to locate safety hazards and to determine any instances of deterioration which might seriously damage the building. The person in over-all charge of the maintenance program should make an inspection of each building at least once a month. The building principal should make a deliberate maintenance inspection weekly. The custodian should continuously inspect and perform or report needed maintenance.

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[8] Gerald W. Brekke, "Partners in Maintenance," The Nation's Schools, February, 1960, p. 118.

[9] Richard A. King, "Developing Progressive Maintenance," The American School Board Journal, May, 1958, pp. 55, 65.

2. Detailed records should be kept on maintenance. Any maintenance job that cannot be performed by the custodian should be requested and approved through a requisition. Maintenance jobs, including cost, should be recorded.

3. A work schedule, including specific tasks to be performed, should be drafted for the custodian and for the maintenance director. This schedule should include the regular duties of those involved and should designate the frequency with which these duties should be performed.

4. Centralization of maintenance will reduce the cost. This should include a central maintenance building for the purpose of storing tools, equipment, and supplies, and a place where maintenance to portable equipment can be performed. There are numerous tools and pieces of equipment which are used only occasionally. It is impractical to provide this equipment for each campus. (Consult Chapter V on The Maintenance Shop.)

Cost Analysis

The amount which should be spent on plant operation and maintenance is indeterminate. It is impossible to set an optimum for such expenditures because local conditions such as the age of buildings or local wage scale will greatly influence the cost. It is generally recognized that the costs of labor will consume a minimum of 60 per cent of the maintenance budget. A recent report on average costs indicates that in some districts as little as one per cent of the budget is spent for maintenance, while in other districts appropriation for this purpose is as high as 13 per cent. The median district in the United States is spending $11.60 per pupil for maintenance. This represents 3.35 per cent of the median district's budget. Ten per cent of the schools spend better than 6 per cent of their budgets on maintenance alone. (Chapter XIV contains statistics on maintenance budgets.)

There is almost as much variance in that which is spent for operation. The median district in the nation is spending $32.10 for operation. This amounts to 10.5 per cent of the net current operation budget. Twenty-five per cent of the nation's districts are spending $38.59 and 10 per cent are spending $47.36 for plant operation.[10]

Actually, the breakdown in cost between maintenance and operation is not a true reflection of the true cost of maintenance because a large portion of the maintenance work is performed by the regular custodian whose salary is included in the operation. Operation and maintenance are two-edged swords. Any district that spends too little for these vital services is faced with the prospect of deteriorating buildings, a poor teaching situation, and lowered morale.

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[10] Paul Abramson, "How Much Should You Spend on Maintenance and Operation?" School Management, January, 1961, p. 110.

Economies in Maintenance

Real economy in maintenance can be achieved by following simple rules, some of which are:

1. Standardize component parts. With similar types and sizes of material and equipment, a small but complete stock of repair parts, replacements, and tools are carried in inventory. Repairs are made promptly and your maintenance personnel, having standard repairs to perform, should be more proficient. Good examples of items which lend themselves to standardization are lighting fixtures, window glass, and audio-visual and laboratory equipment.

2. Request architects to supervise construction and inspect incoming materials. This will protect your district against substitution of inferior products and assures that all work has been properly accomplished. You should receive the value for which you have paid, an important factor in reducing future maintenance.

3. Obtain services and equipment from nearby suppliers, if reasonably priced. Otherwise, there may be considerable delay before equipment failure is rectified.

4. Familiarize maintenance personnel with operational details of all equipment before the school is accepted. Get plans, specifications, and operating manuals from architects and contractors. See that your personnel are trained; manufacturers whose equipment is being installed will generally provide factory-trained instructors for this purpose.

Summary

School maintenance and operation are integral phases of the total educational program. They have direct and lasting effect upon the learning program. An administrator who neglects this phase of his responsibility is contributing to a learning deficiency. On the other hand, an administrator who places too much emphasis on plant operation and maintenance through excessive time and expenditures is doing so at the expense of the instructional program. A proper ratio of time and expenditures can be assured only through an efficient and well-trained organization for maintenance and operation.

The importance of regular, systematic, and complete maintenance can hardly be exaggerated. It is the main offset to depreciation which begins even before a building is completed and occupied and continues with acceleration until it has been replaced.

Depreciation varies, of course, with the type and quality of the original construction. It affects certain parts and equipment more rapidly than others.

Care in operation is also a factor. The best guarantee of the continued usefulness of a school's physical plant, as near to the original state as possible, is found in its adequate and efficient maintenance. Without that, the life of the building will be greatly shortened and its usefulness greatly impaired.

The number of employees is not the only determinant for good school housekeeping practices. Supervision, supplies, equipment, caliber of personnel, operational policies, morale, wages, on-the-job training, and materials and equipment are some of the many sides to a complex management problem.

When a district spends too much of its funds for operation and maintenance, it is possible that expenditures for instruction may suffer. Prudent maintenance and operation eliminate emergency and major repair bills. A good measure of the efficiency of plant operation and maintenance is a constant ratio in the percentage of the budget spent for this purpose as compared to that spent for instruction.

Suggested Readings

Abramson, Paul, "How Much Should You Spend on Maintenance and Operation?" School Management, January, 1961, p. 110. Reports the results of a survey of comparative maintenance and operation costs.

Brekke, Gerald W., "Partners in Maintenance," The Nation's Schools, February, 1960, p. 118. Suggests a dual custodial plan and gives evidence that this plan will save money and improve school housekeeping.

Fernalld, Otto K., "How to Save Money on Maintenance," School Management, November, 1959, p. 51. Suggests numerous ways and means of improving maintenance without raising maintenance costs.

King, A. Richard, "Developing Progressive Maintenance," American School Board Journal, May, 1958, pp. 55, 65. Suggests a practical plan for programming for maintenance.

Linn, Henry H., "Maintenance and Operation Fundamentals," *The Nation's Schools*, November, 1958, p. 65. Offers many valuable procedures for efficient and economical maintenance of school buildings.

Linn, Henry H., *School Business Administration*, The Ronald Press, New York, 1956. Contains a wealth of information concerning maintenance and operation of school plants.

McEwen, Fred, "Contracts Versus School Maintenance Staff," *American School Board Journal*, Devember, 1957, pp. 43-44. Presents the pros and cons of contracted maintenance work and work performed by the school staff.

Miller, Van, and Willard B. Spalding, *The Public Administration of American Schools*, Yonkers-on-Hudson: World Book Company, 1952. Emphasizes the details of a thorough maintenance program.

Viles, N. E., "Maintaining and Replacing Schools," *American School Board Journal*, July, 1959, pp. 22-26. Discusses the basic features in planning for maintenance.

Yeager, William A., *School-Community Relations*, The Dryden Press, New York, 1951, pp. 74-83. Examines the school administrative process from the standpoint of public relations.

CHAPTER V

PREVENTIVE MAINTENANCE

The best educational philosophy and planning often become comprised to a point of complete mediocrity by lack of funds, poor use of adequate funds, or a partial, short-range viewpoint. Very often the cost of a school plant is considered only in terms of the original investment. The long-range price paid for operation and maintenance over forty to fifty years is often overlooked in a shortsighted concern about initial construction costs.

The school executive, empowered by and obligated to his school board to see that the school plant is kept functional and operating, has the duty of seeing that regular inspections are made, that adequate funds are budgeted, that competent personnel are employed, and that a sound program of continuous preventive maintenance is achieved.

Economy of Maintenance

Preventive maintenance begins with the school architect and the persons responsible for designing the buildings and facilities. For the average school system, it is impossible to have a good preventive maintenance program unless the buildings in the district are designed with a view to their upkeep. Most districts are not in a financial position to hire the necessary skilled labor to cope with all of the new designs of heating units, window units, door closing devices, public address systems, automatic this and automatic that. A good school building plan goes beyond the usual considerations of design, function, and cost; it also considers what the annual cost of operation and maintenance will be, and approximately how soon the plant may require major repairs. It costs taxpayers as much to operate schools as it does to acquire them.[1]

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[1] "Is Your District Wasting Maintenance Dollars?" School Management, February, 1961, p. 33.

In designing a school building, there are numerous maintenance factors to consider:

Site. Is it well drained? Is it good land? Will there be a problem of handling water running through or off certain areas? Will there be an erosion problem with each storm? Will it be difficult to grow and maintain good turf? Excessive ground water can cause high maintenance and operating costs if sump pumps are required, particularly in low boiler rooms. Although not necessarily a maintenance problem, soil bearings should be taken because they may greatly affect initial foundation costs.

Construction Method. Types of building construction will vary with localities. If a choice is available without too much extra cost, avoid the use of wood in areas close to the ground. Treatments are good, but not foolproof. Avoid using steel near damp areas. Corrosion is a major type of depreciation. Painted and treated surfaces are acceptable, but nature, especially in the damp, salty Gulf Coast area, breaks down such coatings. Masonry walls should be packed solid with mortar near the ground because termites can travel great distances through hollow or porous walls.

Building Structure. If possible, exterior walls should require no paint. The climate will dictate just how much expansion to expect, and the architect and engineer should provide proper expansion joints. Once the building starts to crack, the deterioration can't be stopped, and it will then be necessary to calk annually. Also, children when playing will throw balls at school walls, lean against them, and climb any that are climbable. They will pick calking out of sashes and rearrange the school name if the letters are too low. Brief your architect in advance.

Interior walls get dirty where they are within reach of boys and girls. Select materials that can be easily cleaned to avoid costly repaint jobs. Stained woodwork often stays clean longer than painted surfaces. Metal, such as stainless steel and aluminum, is even better. Wall materials used in certain areas within the buildings should be selected to withstand excessive abuse.

Floor materials are many, and no one is a cure-all. One may be suitable for the classroom but too hard to clean for general corridor use. Vinyl asbestos is an economical, tough, and good-looking floor covering for classrooms and offices. For entrances, lobbies, corridors, and restrooms, few materials excel terrazo. It may be costlier initially but will outlast other floor materials and require less maintenance.

Grit, tracked in from playgrounds or concrete walks, is an enemy to floor maintenance. One might consider built-in rubber matting at entrances or use non-slip rubber matting inside entrance ways. Either plan saves much in floor maintenance costs.

The roof frequently leaks too soon with endless damage resulting. Demand a good quality roof, preferably a bonded one carrying a 20 year guarantee. But remember it is useless to have a bonded roof without bonded flashings. Both can be bonded, but they must be properly designed and the right type. Bonding protects the district against material failure but not against poor methods or labor fault.

Avoid metal gutters and spouts. Install interior rain leaders; they don't freeze or tear off the walls.

Mechanical Items. Discuss the various types of heating. Perhaps coal is the lowest cost fuel in some parts of the country, but keep in mind the expense of ash removal and man-power for firing boilers. Stokers do not fill themselves. Some controls require much more checking than others; can they be easily replaced? Brief your mechanical engineer on the use and abuse that boys and girls can make of all plumbing fixtures. Urge him to select the simplest and hardest-to-take-apart kind and to take special care they are anchored securely. Never underestimate a youngster's ability to dismantle. Moreover, the plumbing should be of institutional standard because in public usage it receives much more wear than do ordinary home fixtures.

Provide ventilation throughout the plant, especially in toilets, janitor's closets, storerooms, and crawl spaces. These areas are often missed and are most difficult to maintain when excessive moisture builds up. Interior lavatories must have mechanical ventilation. The maintenance of ventilation systems is a major task of custodial personnel.

Costs of electric fixtures and electricity vary by areas, but incandescent fixtures generally are less expensive to install than fluorescent. However, the reverse is true of their operational costs. It is also generally true that a higher voltage than the usual 110 V costs less for operation if used for the internal distribution system, especially in large schools. An illumination system must be judged by the illumination delivered at desk height. Ask your engineer about these items.

Economies Effected by Planning

Gibson has stated:

> The functionally efficient school plant provides for its occupants the amenities which the American public associates with a good standard of living, a physical environment which promotes working comfort and efficiency, and is constructed of materials which give maximum life to the buildings and ensure low maintenance costs.
>
> A poor school district cannot afford to build cheap buildings. The only place money can come from to pay

> the constant, excessive maintenance costs of cheap construction is out of funds intended for a good instructional program. In this situation the cheap school plant soon disintegrates into a health and educational hazard for the students we compel by law to occupy it.[2]

Economy is achieved in a combination of ways:

1. Construction. The nature and cost of maintenance should be budgeted in the planning stage. Higher initial costs could be justified where there is assurance of potential savings in maintenance costs.

2. Equipment. Careful selection, location, and installation with a view towards preventive maintenance will promote economy.

3. Scheduling. In the proper scheduling of routine maintenance work to achieve maximum service and protection, regular inspections will provide a check for determining amount, type, and frequency of replacement and repair.

4. Improving Efficiency of Own Staff. Many man-hour savings can be realized by certain work simplifications, by in-service training of maintenance personnel, and by addition of labor-saving equipment.

The greatest economies can be effected by placing the responsibility for maintenance in the proper hands. The attitude, morale, and zest for the job are of prime importance.

Other Values of Preventive Maintenance

Good maintenance will add years to the life of a building and its contents. Whether one thinks of window sashes in need of paint, walls in need of mortar, or chairs in need of screws, proper preservation of the building and its equipment must be pointed up constantly in working and planning with school custodians. Too often custodians are prone to accept what they find and do little towards improving a situation.

Preventive maintenance is an economy in that (1) it eliminates the employing of extra personnel for emergency repairs, (2) it insures against school plant failure or larger expenditures later by a reasonable expenditure when needed, (3) it not only decreases the cost of correction but actually helps maintain the value of the school plant, (4) it adds to the safety of school children and of other school personnel, (5) it results in better job completions by having regularly scheduled the work, (6) it usually reduces utility expenses, (7) it increases the efficiency of the instructional program by providing more attractive and pleasant environment for students, teachers, all other school personnel, and visitors, and (8) preventive maintenance means well maintained buildings and grounds at all times, which will insure better public relations from all citizens of the community who may visit schools only one or two times in several years. First impressions are lasting impressions in establishing public esteem.

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[2] Charles D. Gibson, Chief of the Bureau of School Planning in California. Excerpt from address to Schoolhouse Conference, Austin, Texas, March, 1960.

Programming Preventive Maintenance

The number and importance of repairs needed are greatly reduced by a well-planned and ably executed preventive maintenance program. Some of the important essentials to an efficient maintenance organization are:

1. An adequate, loyal, skilled working force.
2. Establishment of long-range priority procedures for maintenance work.
3. Standardization of practices, tools, materials and supplies.
4. Regular inspection-reporting procedures.
5. Work schedules tailored to size and skills of staff.
6. Good human relations.
7. Careful budgeting.

Personnel

The most important man in the over-all program of preventive maintenance is the school custodian. Next most important is the school principal. The school custodian should be a semi-skilled carpenter, plumber, electrician, painter, etc. He should also be trained to recognize a maintenance job that he cannot do with his limited skills, for if he is not, he could cause more damage than he would do good. Large systems employ skilled craftsmen as full-time maintenance workers. Small schools must depend on building custodians to do minor maintenance work, with major repairs either contracted-out or done seasonally by employment of skilled tradesmen.

Inspections

A regular program of school plant inspection tends to reduce the number and magnitude of emergency repairs, causes less interference with the educational program, makes possible adequate budgeting of funds necessary for routine repairs, and regulates better the work-load of the non-teaching staff. Chapter XV contains examples of inspection checklists.

Good Reporting

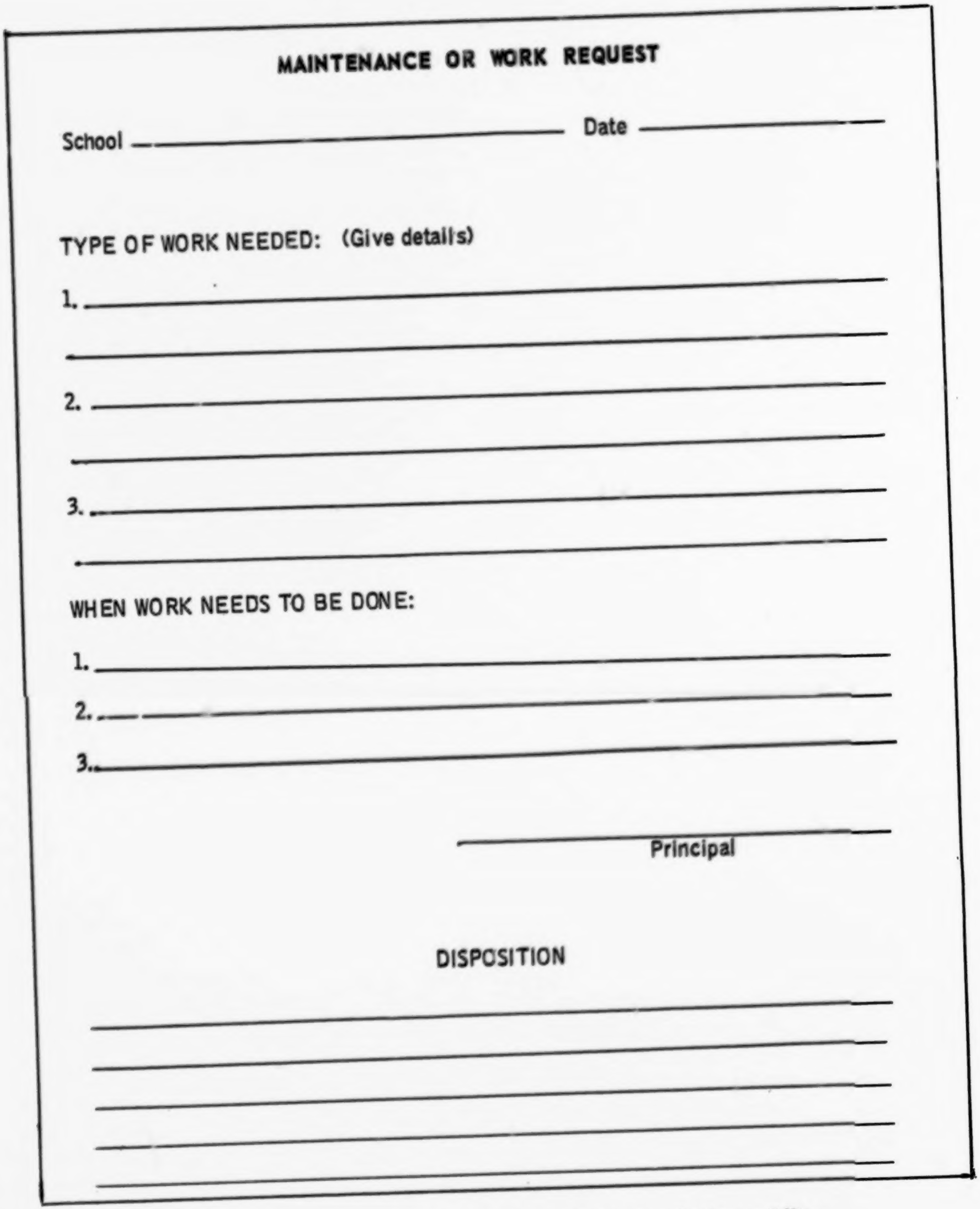
A good school custodian has the ability to make most minor repairs; in addition, a good custodian will report all needed repairs to his principal, who will in turn make his official report to the person responsible for general maintenance for the district. Without an efficient system of reporting, a well-organized program of preventive maintenance would not exist. (Figure 5.)

Follow-Through

A well-organized maintenance department should carry through with the necessary corrective work needed at the time such work is reported. Otherwise, the maintenance director should give a clear explanation to the school principal and to the custodian why such necessary repair is not made at this time and when it will be made. It is discouraging and demoralizing for a custodian or principal to officially report something that needs to be repaired and not have it fixed within a reasonable length of time. The maintenance department ought to report back to the individual requesting maintenance work when something has been fixed or else the reasons why it will not be repaired until a specific date.

Standardization

With the high and rising costs of maintenance, both materials and labor, it has finally come to the point that school systems must begin setting up programs of standardization. Standardization, of course, should be carried only to the point of being economical and practical, for it could cause drabness in school house construction, arrangement, and design. Industry has made it almost impossible for a school district to standardize on many of the items that are used in the construction of buildings and facilities. Therefore, in order to retaliate against the current trend of a new model or design of an item each year, some kind of cooperation among school districts in various large areas could be established. Standardization of various items according to set specifications would assist the manufacturers to profitably manufacture the needed merchandise. Examples of such standard items would be maintenance materials as asphalt tile colors and designs; asbestos siding colors and designs; window units; outside



MAINTENANCE OR WORK REQUEST

School ______________________ Date ______________

TYPE OF WORK NEEDED: (Give details)

1. ____

____

2. ____

____

3. ____

____

WHEN WORK NEEDS TO BE DONE:

1. ____
2. ____
3. ____

____
Principal

DISPOSITION

____

____

____

____

____

NOTE: An original and one copy should be forwarded to the Business Office.
Source: Dickinson, Texas, Independent School District.

Maintenance or Work Request Form

Figure 5.

and inside doors; door hinges, stops, and closers; thermostats; window shades and blinds, desks, etc.

Upkeep of Machines

Obsolescence is an ailment for which the remedy is continual care and improvement. Machines, unfortunately, cannot be retained or reoriented when their day is done. The best mechanics say that all machines should receive periodic inspections, cleaning, and oiling. When stoppages or breakdowns occur, the machine, if seriously injured, should receive a complete overhaul. Renewal of major operating parts at regular intervals is sound advice, even as a good mechanic changes his automobile sparkplugs, tires, and brake linings after a certain time or mileage, not waiting until trouble develops. Waiting could lead to extensive damage and costly repair bills.

Good practice in keeping machines in the best operating order is to (1) set up a regular inspection-servicing routine for all machines; (2) follow carefully the manufacturer's directions (attached to each machine) for use and maintenance; and (3) keep records on each piece of machine equipment--date installed, dates of inspections, servicings, and repairs or parts replacement. With stationary machines, these data can be card posted on or near the equipment, and for portable machines at the place where each is customarily stored.

The criteria for determining whether an item should be repaired or replaced necessarily takes into consideration more than the operability or exhaustion of the item. Obsolescence and inadequacy should be considered as well as exhaustion and excessive cost of repairs. These factors can only be computed from adequate records.

Depreciation

Depreciation begins the first time a school building is put into use. This applies to all school facilities, including equipment. Reeder has listed four factors which operate to cause "decrepitude," namely: wear and tear of normal usage; physical decay; obsolescence, that is, losing its educational utility to a modern program; and accidents or unforeseen circumstances which result from negligence or defects in construction.[3] Deterioration may result from carelessness in use or from weather. The rate of depreciation will vary with supervision, climate, and the cooperation and discipline of those who use the facilities.

While weather is the greatest cause of outdoor deterioration, normal wear and tear of the daily pupil traffic and activity is the reason for indoor deterioration.

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[3] Ward G. Reeder, The Fundamentals of Public School Administration, (New York: The MacMillan Company, 1951), pp. 317-318.

Depreciation is affected by the immediacy of repairs, costs, and the general attitude of employees and administration to do something about a situation when it arises.

Wind, rain, snow, heat, freezing, and thawing--all have a damaging effect on the mortar joints in a brick or stone building. After years of such erosion and deterioration, a building often has many voids and holes in the mortar joints. These defective joints allow rapid deterioration from water damage, which can be costly. Plaster, paint and other interior finishes can be ruined by water seeping into a building.

When inspection reveals this type of weather erosion, the eroded or deteriorated mortar joints can be routed out by use of special drills in a power tool, the crumbs and residue blown away by pressured air, the joints resealed with fresh mortar and tooled to a neat finish. This is a simple and inexpensive operation, and can save untold maintenance dollars.

Inspection should note scaling, cracking, and peeling of paint and putty. Any of these conditions existing on wooden frames and sashes should be attended as soon as possible, to prevent rotting of wood. Steel frames can wait for routine care until unusual corrosion occurs.

Staff, Student Participation

The administration should see that the teaching staff understands the problems and advantages (to them!) of good maintenance, and that the teachers orient their pupils to good housekeeping habits--putting waste paper in proper receptacles, not marking up desks or walls, etc. The staff should also be well-schooled in the care and operation of machines that come under their care. These precautions will save much time for custodians and maintenance workers, allow a better job to be done, and contribute to the entire school morale.

Carelessness on the part of students and sometimes of adult groups may cause damage to equipment and facilities. Here is an area where proper supervision is most of the answer. Horseplay and other unthinking acts by students can result in injury to themselves and damage to furniture, drinking fountains, glass, etc. The student council can set up codes of conduct and enforce good conduct in halls, auditorium, cafeteria, etc. Teachers should be alert for such behavior.

Malicious Mischief

Vandalism is a cost factor in some school districts. Night lights, with unbreakable shields, are excellent deterrents for prowlers. Certain schools are using plastic as window panes where glass breakage is frequent; others use protective screens of hardware cloth. Fences, trees, and foundation shrubbery are used to reduce accessibility to buildings.

Dayton, Ohio, is using electronic and ultra-sonic detecting devises with great success. These are fairly expensive to install, but for schools with a history of repeated burglaries or vandalism, Dayton's experience makes the installation cheap. These alarm-detecting devices are connected to the local police alerting system. As a Dayton school official puts it, "We have slashed losses from malicious vandalism and thievery; the break-in rate has dropped, as news of 'captures' has circulated, and our total annual cost is but a fraction of our previous yearly losses."[4]

The employment of night watchmen, particularly on nights of large school or community activity, coordinated with city or county police, proves a safeguard against mischief. The school staff may be assigned, with time off given the following day, or extra pay for the extra work.

Summary

Adequate maintenance to extend the use of a school plant is one of the most important means now available to effect school economy. The time to consider maintenance cost is when the school plant is being planned, designed, and constructed.

A carefully planned program takes into account not only the corrective aspect of maintenance, but the preventive aspect as well.

Preventive maintenance is a program of service, inspection and correction for the purpose of preventing expensive repairs and breakdowns before they occur. Preventive maintenance in a school plant should accomplish the following purposes:

1. More attractive plant.

2. Lower maintenance costs.

3. A longer period of usefulness.

4. Reduced operating costs.

5. A safer structure.

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[4] "How Dayton Minimizes Vandalism Losses," American School Board Journal, May, 1960, p. 48.

CHECKLIST OF PREVENTIVE MAINTENANCE

Type of Work	Where	When	Work Done by	Remarks
Masonry				
Roofing				
Flashings				
Glazing				
Caulking				
Exterior Painting				
Ventilators				
Fencing				
Sidewalks				
Landscaping				
Fire Escapes				
Floor				
Ceiling				
Interior Walls				
Stairways				
Hardware, Doors				
Hardware, Miscellaneous				
Shades, Blinds				
Furniture				
Water System				
Boilers				
Radiators				
Vents				
Filters				
Fans				
Ducts				
Switchboxes				
Clock System				
P-A System				
Wiring				
Fixtures				
Fire Alarms				
Fire Safety Equipment				
Refrigeration				
Plumbing				
Grease Traps				
Appliances				
Equipment				
Playground Apparatus				
Landscaping				

Note: Checklist, Chapter XV, for frequency of inspections.

A good preventive maintenance work program incorporates inspection schedules, well-defined work schedules, adequate staffing, sound budgeting, functional organization, and usable records. A successful preventive maintenance program needs the leadership of a competent school executive who can develop in the entire school staff acceptance of his economy policies.

Suggested Readings

Fernalld, Otto K., "How to Save Money on Maintenance," *School Management*, November, 1959, p. 51. Offers suggestions for economy in school housekeeping.

Hawkins, Walter C., "Preventive School Maintenance Program," *American School and University*, Vol. 1, 1949, pp. 304-305. Considers preventive maintenance from a cost standpoint, with statistics that are still contemporary.

"How Dayton Minimizes Vandalism Losses," *American School Board Journal*, May, 1960, p. 48. Reports how one school solved a vexing problem of vandalism.

"Is Your District Wasting Maintenance Dollars?" *School Management*, February, 1961, p. 43. Provides several tested procedures which result in economy of maintenance work.

Moyle, Wallace A., "An Effective Painting Program," *American School Board Journal*, November, 1957, p. 23. Furnishes information on scheduling of preventive maintenance painting.

Operation and Maintenance, Handbook #7, State Department of Education, Albany, New York, 1955. Reports under ten headings the results of a survey of practices in more than 300 public schools in New York state.

Reeder, Ward G., *The Fundamentals of Public School Administration*, The MacMillan Company, New York, 1951, pp. 317-318. Covers many aspects of the responsibility of school management for plant maintenance.

"Source Book for School Plant Management," Proceedings of the 1958 Administration and Supervision Workshop, College of Education, The University of Houston, Houston 4, Texas. Covers a wide variety of maintenance areas, with accent on responsibility.

Stautz, Carl H., *Planning Your School Building Dollar*, Chilton Publishing Company, Philadelphia, 1960. Points up the importance of planning for maintenance while planning the building.

CHAPTER VI

THE MAINTENANCE SHOP

The school plant contains classrooms, laboratories, auditorium, gymnasiums, vocational shops--all facilities intended to house and implement the instructional program. This chapter considers the role of a work place for the school maintenance staff, the maintenance shop, a necessary adjunct to a successful school plant management program.

Central Maintenance Shops

The shop facilities needed by a school district will depend on the volume and nature of the maintenance work to be performed.

Determining Needs

Some factors which condition school district maintenance shop and equipment requirements are size of the district, board policy, and services rendered by school plant personnel. For example, if a school district is small, has no definitely organized maintenance program, contracts most of its maintenance work, and requires only routine service from school plant personnel, it will have little need for a maintenance shop with specialized equipment. On the other hand, medium to large districts, having well-organized plant operation and maintenance departments whose personnel perform all operating and most maintenance tasks, need special buildings and an assortment of tools and equipment to provide prompt and economical service.[1]

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[1] R. N. Fincham, Organizing the Maintenance Program, U. S. Office of Education, Bulletin No. 15 (Washington 25, D. C.: United States Government Printing Office, 1960), p. 57.

In school districts where such shops are needed but have not been established, careful attention should be given to: (1) type, size, and location of the maintenance shops; and (2) suitable shop equipment.

Types of Shops

In small districts where work volume is small, maintenance personnel is limited, and only minor repairs are made, there may be no justification for elaborate shop facilities. In such instances, a custodial or maintenance bench and storeroom located in each school building would suffice.

In larger districts this needs to be supplemented with a general shop housing equipment for specialized repair jobs, such as carpentry, machines, welding, electrical, and hardware repairs.

In very large districts, where the volume of work in each of several different repair categories is heavy, it may be feasible to plan a separate shop for each of several repair areas, such as furniture repair, plumbing work, metal work, automotive work, electrical and appliance repair shop, etc.

Regardless of shop type, outstanding economies in plant operation and maintenance are said to result in school districts where maintenance shops are operated.[2]

Shop Size

Shop size, a factor which influences shop efficiency, must be taken into consideration when planning a maintenance shop of any type. Ample space should be provided for administration; for the storage of raw materials and supplies; for painting; for work areas and the installation of appropriate machinery and equipment; for toilet, shower, and dressing facilities for employees; for the storage of items brought in for repair; and in some cases, for the storage of repaired items. Special loading ramps or docks are needed to facilitate the trucking and routing work. Local variations in types of shops, in number of employees, in operations performed, in equipment installations, and in storage requirements preclude a listing of specific space requirements for each of the areas listed.[3]

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[2] Harold D. Hynds, "Long-Term Economies in Maintenance and Operation," School Management, March, 1948, pp. 4-5.

[3] N. L. George, "Some Principles for the Organization and Operation of a Central School Shop Service," American School Board Journal, February, 1950, pp. 41-92.

Shop Location

In order to facilitate the work of maintenance personnel, there should be, if at all possible, a central maintenance shop-warehouse. This building should be centrally located, easily serviced by delivery trucks, and have ample space for storage and work areas. Here are stored all supplies purchased in major quantities, which are distributed to individual building custodians. This central shop, containing adequate tools and equipment for routine maintenance work, is the school maintenance staff headquarters.

Storage of Combustibles

From the standpoint of safety, it is well to have a separate building in which to store inflammable supplies such as oils, paints, varnishes, power mowers, and fuel. This building should be adjacent to the central shop. It may be economically constructed of corrugated sheet metal, on a concrete slab, with metal supports and shelving.

The maintenance shop should be adequately equipped to handle most minor repair work that the local staff can accomplish. Major repairs could be contracted out, or handled during vacation periods. Emergency repairs (electrical, gas, telephone, etc.) can usually be handled by calling in the local utility company trouble shooters.

Responsibility

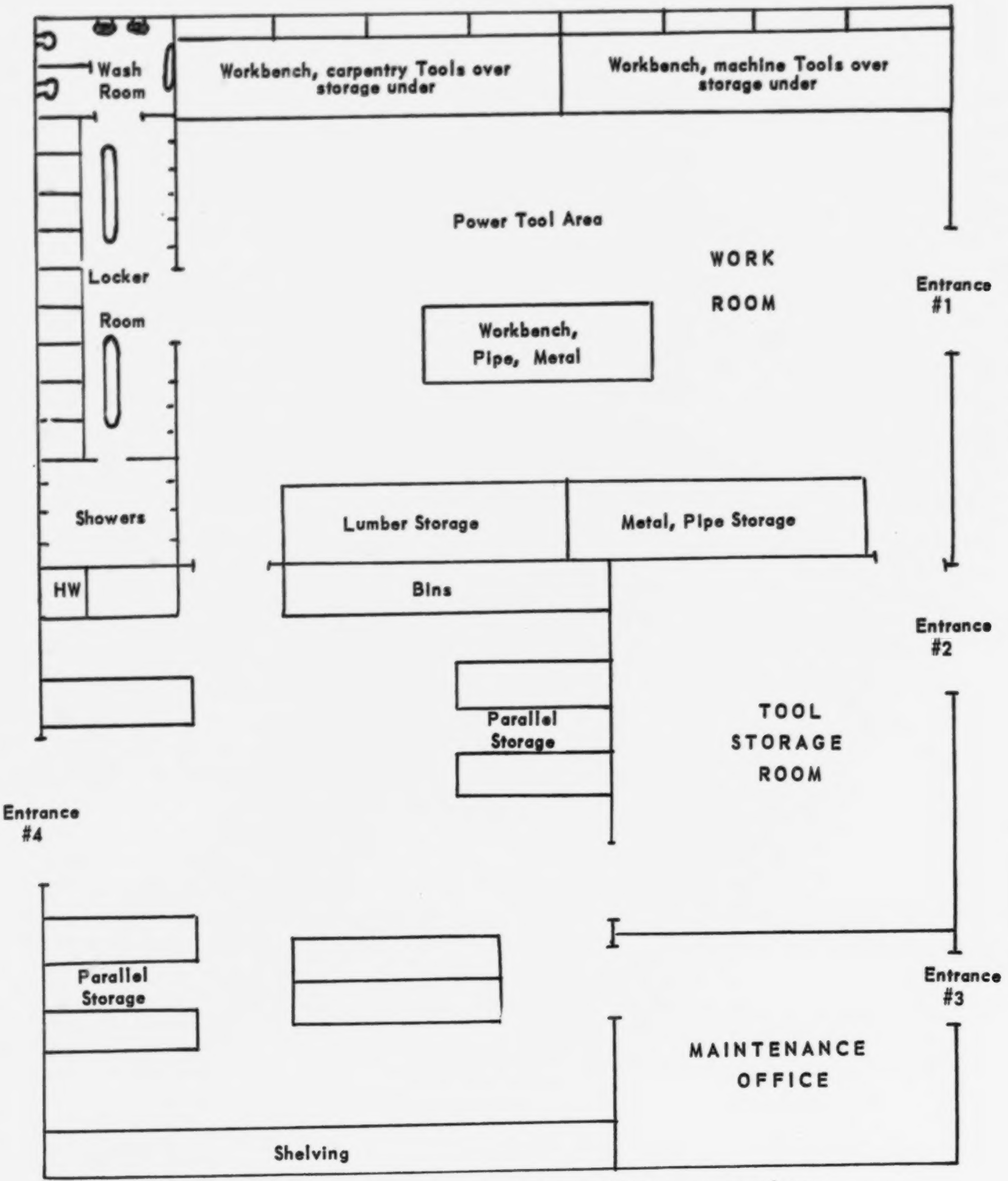
At least one skilled and intelligent workman must be employed by a school district, regardless of size. This person is often designated the chief custodian, head maintenance man, or whatever title goes with being in charge of buildings and grounds, directly responsible to the superintendent. This man is the strong right arm of the business administrator, and to him is entrusted the responsibility of seeing that the plant is kept functional and operating. The central maintenance shop usually serves as his office. Here communication can be established between the administration and the maintenance staff, via public telephone, interoffice telephone, or the school public address system.

Shop Tools and Equipment

There is no substitute for good tools in the hands of skilled workmen. If the school district can afford to pay wages attractive enough to command skilled personnel, it can afford to furnish them with tools and supplies adequate for the job. From the standpoint of both economy and efficiency, it makes good sense to buy first-class tools, take good care of them, and let only good hands use them. Tools were

Y------------DATE-------- SUBJECT---------------------------------- SHEET NO.---------OF------

HKD. BY------DATE-------- -- JOB NO.--------------------


Wash Room
Workbench, carpentry Tools over storage under
Workbench, machine Tools over storage under
Power Tool Area
WORK ROOM
Locker Room
Entrance #1
Workbench, Pipe, Metal
Showers
Lumber Storage
Metal, Pipe Storage
HW
Bins
Entrance #2
Parallel Storage
TOOL STORAGE ROOM
Entrance #4
Parallel Storage
Entrance #3
MAINTENANCE OFFICE
Shelving

Size dictated by need.

Separate, fireproofed storage for combustibles; corrugated iron shed, concrete slab, metal shelving, adjacent to shop.

Adequate lighting, power outlets; connected to school office by telephone or P-A system. Adequate heating and ventilation.

SUGGESTED MAINTENANCE SHOP LAYOUT

Figure 6.

fashioned to aid, not replace, the human hand.[4]

Use of School Shop Equipment

In a small school system with a limited budget, economy of funds and effort may be effected by using vocational-industrial school shop power tools and machines in maintenance work but only if the equipment is heavy-duty type. There is no need to duplicate expensive equipment such as planers, band saws, welding-cutting machines, etc., in the very small school districts. The shop classes of small districts occasionally could perform small maintenance jobs insofar as it fits into their practical class work. However, the use of school shop equipment by the maintenance force should be restricted to major power equipment, not to include minor tools and supplies. Duplication of sets of minor tools is a small cost item. Also, school shop equipment must be used for maintenance work at a time and in a manner not to interfere with scheduled classes or activities.

Tool Control

If the school has a central maintenance shop, tools may be checked out by the employees simply by hanging a numbered tag (each employee is numbered) on the rack, drawer, or board where tools are kept, or by signing out tools on forms kept on a handy clip board.

Each worker under this plan assumes responsibility for the tools he borrows, and he must return them to their proper place or be charged for them. The cost of lost tools should be deducted from an employee's paycheck. The cost of tools lost through the frequent avenue of "nobody knows what happened to it" could be charged to all persons having access to those tools, including the administrator and the maintenance workers. This plan would soon encourage a better attitude of use and care of removable tools and equipment.

Carelessness with tools or equipment could be expensive and dangerous. Repeated carelessness should call for summary dismissal of offending parties.

Besides the central shop tools, various workers such as building custodians should have sets of tools. These should be kept in locked cabinets and the individual made responsible for their condition.

Care of Tools

It is imperative from the standpoint of economy and good workmanship to keep tools clean, oiled, sharp, and rustfree at all times. All persons using tools are responsible for keeping each item in a state of usefulness.

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[4] N. L. George, Operation Manual, Oklahoma City Schools, 1957, p. 14.

Tool Storage

Many tools can be hung in a locked tool room on a large painted board with spaces sketched in a contrasting color showing the tool that belongs in a particular place. This is easily done by tracing the outline with pencil on the board and painting it in with a small brush. Some tools and parts (drill bits, hack saw blades) must be kept in drawers or boxes. These spaces should be clearly labeled as to contents. Two or three clip boards should be in the tool room, one for tool check-out forms, one for a short list--items shortly to be needed or replaced--and a third clip board for the tool room inventory.

Records and Inventories

The maintenance chief must keep up-to-date records and inventories of all tools, equipment, and supplies coming into and going out of the central shop-warehouse, and notify the purchasing agent in advance of needed replacements or new purchases.

Each repair job must carry a job ticket showing manhours, materials consumed, and overhead. You may be surprised to find your central maintenance repair jobs costing more than to contract them out--especially when overhead is figured in the job.

Necessary Tools and Equipment

The amount and kind of tools and equipment needed for maintenance operation is determined largely by:

1. The quality of maintenance service desired.
2. Size of the school plant to be serviced.
3. Skill of employees.
4. Amount of work done by school staff.
5. Budget limitations.

Following is a list of minimum tools required for quality maintenance:

Hand Tools (Carpenter)

Brace and bits
Claw hammers .(small, large)
Drawknife
Drill set (for power drill)

Hand Tools (Machine)

Blow torch
Bolt cutters
Cold chisel set
Glass cutter

Hand Tools (Carpenter)

File set
Folding rule
Nail set
Paint brushes (various)
Planes (large and small)
Pliers
Plumb line
Power hand drill (1/4 inch)
Putty knife
Saw horses (2)
Saws (rip and crosscut)
Scrapers
Screwdriver set
Squares ("T" and "L")
Spirit level
Steel tape (100 feet)
Tack hammer
Wood chisel set
Wood vise
Yardsticks
Handy tool kit for carrying to job

Yard Tools

Axes (single, double bitt)
Grass hooks (2)
Grass shears
Hedge clippers
Hoes
Pickaxe
Pruning shears
Rakes (lawn, garden)
Scythe
Shovels
Spading fork
Wheelbarrow

Hand Tools (Machine)

Hack saw (extra blades)
Hammers:
  Ballpein (small,large)
  Sledge (8 ounce, 16 ounce)
  Nail bar (small, large)
Oil cans
Pliers wet (4)
Pipe cutter
Pipe vise
Pipe dies (set)
Power drill (1/2 inch)
Power bits (set)
Scoop shovel
Sharpshooter shovel
Soldering iron (electric)
Star drills
Wrenches:
  Crescent (set)
  Open-and (set)
  Pipe (set)
  Socket (set)
  Stillson (14 inch, 18 inch, and 24 inch)

Miscellaneous Equipment

Brooms
Buckets
Extension cords (various)
Extension ladder
Floor machine (sander, polisher)
Gasoline cans
Goggles
Paint spray gun
Plumber's friend
Respirators
Scaffolds
Squeegees

Lawn Care Equipment

- Hoses (3/4 inch, as needed)
- Lawn sprinklers (as needed)
- Mowing equipment:
  - Tractor mower (60 inch)
  - Small power mowers (20 inch and 22 inch)
  - Edger

Miscellaneous Equipment

- Step ladders (small, large)
- Waste receptacles
- Welding-cutting equipment

Stationary Shop Equipment

- Workbench (woodwork)
- Workbench (machine work)
- Mitre board (and saw)
- Lumber rack
- Pipe, metal rack
- Toolboards and racks
- Power tools:
  - Table saw
  - Planer
  - Drill press
  - Power hack saw
  - Forge
  - Jointer
- Cutting torch (Oxy-Acetylene)
- Welding machine (electric)

Maintenance Shop Supplies (Expendable)

- Brushes (various)
- Chamois skin
- Cotton waste
- Glazier's points
- Light bulbs
- Graphite
- Nail supply (assorted)
- Nut and bolt supply (assorted)
- Oils (various)
- Paint supply (standardize)
- Pipe fittings (assorted)
- Putty
- Sandpaper (assorted)
- Window glass (assorted)
- Screw supply (assorted)
- Clean rags
- Wire (assorted)

Custodial Supplies for Each Building

A stock of the following supplies should be available for distribution from a central storeroom, connected with the central maintenance shop for convenience. These items are charged out by buildings to the building custodian's storeroom and workbench:

Expendable Items

- Bon Ami (or Bab-O)
- Brushes (assorted)
- Brooms (assorted)

Non-Expendable Items

- Bucket (common)
- Bucket, wet mop (on casters)
- Dust pans

Expendable Items

Clorox
Dust cloths
Floor cleaner
Floor wax
Light bulbs
Mop heads (dry and wet)
Paper towels
Rags
Sponges
Soap supply
Sani-flush
Toilet paper

Non-Expendable Items

Dust pans
Floor machine
Ladders (various)
Plumber's friend
Simple tools
Vacuum cleaners
  Large (wet and dry)
  Small (chalkboards, erasers)
Wastepaper cart

Custodial Tools for Each Building

Since a school custodian has many different types of jobs to do he will need various kinds of tools. Some special types or sizes of equipment for special jobs may be used to advantage, but in general a standard list may be used for all buildings. These tools may be supplied on inventories to separate buildings or campuses.

A typical list of these tools will include:

Plant Tools

Cold Chisel
Extension Cords
Hack saw, with blades
Hammers
Oil cans
Pliers
Vises
Wrenches (assorted)
Putty Knife
Electric drill
Gas masks
Window jacks
Nail bars
Sewer snakes

Carpenter Tools

Brace
Bits (assorted)
Claw hammer
Plane
Saws
Screw drivers (assorted)
Square
Levels
Star drill
Wood chisels (assorted)
Nail set
Rule, 6 foot size
Files (assorted)

Yard Tools

Axe (single bitt)
Grass tools
Lawn hose (various)
Nozzles (supply)
Shovels
Spade
Sprinklers (as needed)
Grass shears
Power mower (20 inch)
Files
Hoe
Hose connectors
Pick
Rake
Spading fork
Wheelbarrow
Hedge shears

Criteria for Tools and Equipment

Since in purchasing tools, machines, and building maintenance supplies, there is no universal rule regarding performance value, it is up to each user to determine for himself if a product suits him. The following questions are a guide for determining value:

1. Do they do the job?
2. Can they be used easily and simply?
3. Is the cost reasonable?
4. Are they safe?
5. Can they be repaired easily?
6. Can replacement parts be quickly obtained?

Summary

The size and type of the central maintenance shop needed depends on the scope of the maintenance program, which is predicated on the size of the school plant. Regardless of size or type, a facility should be conveniently located, with sufficient space, tools, and equipment to effect a high order of maintenance.

The maintenance program is generally as good as is desired by the school board and the superintendent. The quality of any program is dependent on the funds allocated to it, the ability of personnel charged with maintenance duties, and the amount and type of equipment and supplies furnished for the job. The administrator selects personnel, assigns duties, inspects the plant, and sets the standards. Within these limits, he gets what he wants.

Management of a central maintenance shop requires well-trained administration since doing repairs with your own force is not always an economy. But having skilled workmen on your force does help insure that needed repairs are made promptly. Every aspect of a central maintenance operation requires supervision. The tools and materials must be properly handled. The process and product must be inspected. The delivery and installation must be efficient of time and effort.

Suggested Readings

Finchum, R. N., *Organizing the Maintenance Program*, U. S. Office of Education, Washington, D. C., 1960, Bulletin No. 15. Contains a brief discussion on determining maintenance shop needs, in addition to a wealth of information pertinent to managing the plant maintenance program.

George, N. L., *Operation Manual*, Oklahoma City Schools, 1957. Contains lists of various tools and equipment necessary for school maintenance shops.

George, N. L., "Some Principles for the Organization and Operation of a Central School Shop Service," *American School Board Journal*, February, 1950, pp. 41-92. Sets forth the fundamental principles of organizing and operating the maintenance shop.

Hoek, Floyd G., "Care of Maintenance Tools," *American School and University*, 1953-54, Vol. 25, pp. 377-378. Presents a practical program of tool control and care.

Hynds, Harold D., "Long-Term Economies in Maintenance and Operation," *School Management*, March, 1948, pp. 4-5. Points out the economies to be effected by use of a central school maintenance shop.

School Plant Operation and Maintenance Programs, Florida State Department of Education (Bulletin), Tallahassee, 1959. Includes a very good discussion of central school shops.

CHAPTER VII

AESTHETICS AND THE SCHOOL PLANT

By intelligent, utilitarian employment of aesthetics in the school plant, the administrator gains an asset which appreciably contributes to the educational effort and improved environment of student and staff.

The entity recognized as the school plant is to many people the tangible symbol of an ideal. That ideal is American education. Certainly the plant should be a source of pride and of aesthetic stimulation to students, educators, and community.

Aesthetic Considerations

Aesthetic considerations begin with the site. Together with scholastic population, traffic requirements, budget limitations, and other matters, the attractiveness of the location is deserving of attention.

Location of Site

To the home planner, the situation in which a residence is to be located is of paramount importance. With approximately one-fourth of our population in school, there is no valid argument against desirable surroundings for these people. Topography, quietness, space, vegetation, soil, and drainage should all be considered. The grounds for the school should be more than a specified number of acres.

The Architect

After the selection of the site, the selection of an architect is the most important single decision to be made by the administration engaged in building. All architects do not have the same philosophy, nor do all specialize in the same areas. This is as it should be. Those charged with obtaining an architect should determine the qualities desired. The most able man, for them, is the man whose thinking and experience equip him to best do the specific job they want.

The following checklist might prove helpful:

1. Has he experience in school design?

2. Does his design reflect a philosophy of progress?

3. Will his design be acceptable to your group?

4. Is he familiar with problems peculiar to your situation? These might include drainage, humidity, temperature, lighting, dust, or a number of other items which become major considerations in specific locations.

5. Has he gained recognition from his profession?

6. Relative to advantages offered, do his buildings offer reasonable maintenance rates?

7. Is he completely ethical?

Role of the Architect

After the architect has been selected, his role must be understood and respected by the school representatives. He is qualified to design the school and he is responsible for that design. The complete plant, including grounds as well as buildings, should be a unified whole, offering maximum function and beauty.

In conferences with the architect, the administrator should communicate the needs and desires of the school system. This will include aesthetic considerations. The architect, with his training, experience, knowledge, and taste, is then equipped with the information to assist him in the realization of his design.

Beauty in Design

Beauty exists in many forms. It may be subtly incorporated into architecture in the use of proportion, texture, color, form, and integrity of material. Desirable manifestations of taste can be obtained in many instances without added expense.

Proportion

More than four centuries before the birth of Christ, Greek architects were conscious of pleasing proportion. The Parthenon stands among the great achievements of man because of perfection in proportion. Twentieth century designers, exercising a freedom without precedent, have at their disposal new materials and technical knowledge in ever increasing abundance. Yet the great architecture of our time reflects no single aesthetic trait more emphatically than good proportion. In the Golden Age of Greece, however, man was dominated by rigid rules of proportion. In contemporary design, proportion is a component governed by the designer and his conception of beauty.

Proportion, good or bad, exists in all areas of a school plant. The building is a complex of ratios. The height is in ratio to the length; the length to the width. The doors contain a ratio of width to height and the proportion of the doors may be related to the proportion of the building itself, or to the windows, or both. The very bricks or blocks or panels which comprise a wall may influence other dimensions by a subtle repetition of their ratio. Uses of proportion are unending.

Texture

Texture is employed to gain interest and unity in design. Interest can be achieved with texture as with other elements of composition--by contrast. Glass and fieldstone offer contrast. Brick and roughcut cedar are quite different. Marble and burlap are certainly not similar. Any material assumes increased importance when placed beside an unlike material.

Unity, so essential to order, can be emphasized by repetition of texture. An interesting surface, repeated at various locations, serves to relate different areas.

Color

Color theory, including the psychology of color, has been explored to the extent that color can be used not only for pleasing appearance, but for its effect upon those who live with it. Color assumes a function which must be considered in conjunction with its other qualities.

Color, then, may be regarded according to its visual effects and also in relation to its psychological properties.

Visually, a color can establish harmony or contrast, depending upon its use with a similar color or with an opposite. A library, quietly finished in beige and brown, with olive accents, can become more relaxing and conducive to study. A kindergarten play area might be a more exciting place for small children if several bright colors, offering strong contrasts, are in evidence.

Color and Psychology

From the psychological viewpoint, certain colors are associated with certain characteristics. Red, yellow, and orange are "advancing," or "hot" colors. Blue, green and violet are "cool," or "retiring" colors. In areas designated for study, reading, and lecture, the colors should not invade upon the occupation of the student. However, in space allotted to recreation, sports, and non-academic activities, the more forceful colors, if used well, can be used to advantage. Gray is reccommended for the art area, with limited use of black and white. Any color is affected by the near presence of another. Therefore, the art student can best evaluate the colors he employs if he can work in neutral surroundings.

Form

Flexibility of form is a characteristic of modern design. Again, materials and methods not before possessed by builders must be acknowledged where this freedom relates to architecture. Each succeeding year brings new possibilities of form and shape as technological progress continues. Each new material brings both challenge and promise.

Where once the post-and-lintel and conventional arches and domes restrained architectural design, limitless new construction metnods afford the designer an opportunity to create buildings and forms unlike any of past periods.

Large masses, supported by slender members, appear almost to float on air. Roofs are suspended from great parabolic arches. Tile or glass glistens across the face of beautifully proportioned wall areas. Glass or plastic domes admit light by day and present intriguing forms against the night sky. Molded wood, plastic, and metal assume shapes possessed of beauty and utility.

A play of form, or shape, throughout an architectural design can result in pattern and rhythm, pauses and accents, and a recurring theme not unlike the structural arrangement of a well-conceived musical composition.

Whether forms are geometric or free, angular or curved, they can offer interest, unity, stimulation, and beauty, in addition to purely functional qualities.

Form and Function

A complete philosophy of beauty exists around the concept of rightness of form in relation to function. A sculptor, Horatio Greenough, before 1850 protested against "meaningless ornamentation," and preached, "Form follows function."[1] Louis Sullivan, in the eighteen-nineties, stated this creed which was at once a code for modern designers and a defiance of the traditional.[2] Sullivan, Frank Lloyd Wright, and those who followed changed the concept of design. They relegated to the history class those absurdities of traditional ornamentation which for several centuries had impeded the development of organic architecture.

Aesthetic Planning

In intelligent school planning, we must recognize that efficiency and cost factors are but two of the many elements that enter the picture. Unless art in all its forms is permitted to shine through in infinite variety, giving form, color, texture, motion, rhythm and purpose, planning is hollow and meaningless, and does not express the full depth of our culture.[3]

Integrity of Material

Integrity of material is truthfulness in design. Different materials possess different properties and are best suited for specific uses. A material should be used in the manner which best utilizes its structural and aesthetic qualities and which keeps its identity unviolated.

Concrete should be used where concrete best serves. Steel should be used where steel is best. The same applies to brick, stone, glass, wood, plastic, aluminum, and any other material. Each should be rightly used, in an honest, forthright manner.

To transform the appearance of a material so that it represents another is fraudulent and in poor taste.

Improvements to Existing Structures

Much school construction is in the form of additions and remodeling of existing plants. A clear conception of aesthetics is helpful to any person who must decide how to acquire beauty while spending wisely every dollar entrusted to his judgment.

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[1] William W. Caudill and Thomas A. Bullock, Some Thoughts Concerning Beauty; Caudill, Rowlett and Scott, Architects, Houston, Texas.

[2] Walter Dorwin Teague, Design this Day, (New York: Harcourt, Brace and Company, 1940), p. 50.

[3] Herbert Swinburne, A.I.A., Philadelphia, Pa., School Planning, Vol. 5, Number 1, 1960, p. 2.

By consideration of the grounds, the exterior, the interior (including floors, walls and ceilings), and the furniture, as well as such additions as pictures and music, it may be determined which areas offer the greatest opportunity for school plant improvement.

Grounds

Outdoor areas for play, lounging, classes, and eating can make the school a more interesting place. Patios, fountains, gardens, and woodland all contribute toward an improved environment.

The planting on the school property, except for shade trees, may be flowering or evergreen, or both. It should be native or from a location of similar characteristics, so that a minimum of care is needed. If carefully selected, these plants can provide beauty and color in warm weather and welcome green throughout the winter months. (See Chapter VIII for suggestions on planting.)

Building Exteriors

The exterior of the school, even if old and of unattractive design, can be improved. Painted portions can be maintained bright, fresh, and in attractive color or white. Downspouts, gutters, window trim, and other details should receive this constant attention. Windows, screens, doors, and even shades, must not be permitted to present an appearance of neglect. Often an undesirable feature of a building can be minimized by careful planting of shrubs or vines. In some cases an especially unattractive situation can be improved only by structural change. Careful consideration, however, should precede any decision to spend money on construction solely for the sake of appearance. Only the ablest designer can actually improve an ugly building. Far too often remodeling takes the form of adding ridiculous clichés of modern architecture in a manner that serves to intensify the bad features of the old. When this occurs, the building loses its dignity as well as its identity.

Floors

Floors receive constant abuse and should be constructed of material offering beauty, safety, durability, and ease of maintenance. Terrazzo and many varieties of tile possess these qualities. Often an apparently high initial cost of a floor is justified when all factors are considered. An expense that appears high is frequently justified if other expense is eliminated. Well-kept, attractive floors are necessary to the interior intended to provide a stimulating atmosphere for learning.

Walls

No area of the school building is more constantly viewed than the walls. Whether glass, chalkboard, plaster, wood, brick, or other material, the walls define and restrict and provide a background for all indoor activities of staff and students. If those living within the school are to have pleasing surroundings, the walls must be attractive. Natural materials often offer beauty with minimum maintenance. Painted surfaces are desirable if well maintained, and paint provides more improvement for the cost than any other one item. An advantage also found in painted areas is the ability to control and change color. It is a simple matter to alter color by repainting. Glass walls enlarge the room by the dimensions of the view they provide and increase the beauty of the room in direct proportion to the beauty of the view.[4] If noise control is a problem, acoustical materials in pleasing textures are available for wall covering. Flexibility of design and decoration is attainable by the use of movable wall components. These may be panels, storage units, or folding walls. Space can be enclosed, divided, or freed. The appearance of the wall elements may be neutral to harmonize with any location, or of stronger design to provide contrast and accent where used.

Ceilings

Ceilings are commonly finished for sound absorption, light reflection, and beauty. The ceiling, lacking any of these qualities, should be improved.

Furniture

Well-designed furniture, beautiful and functional, is manufactured for school use. Good school furniture should be comfortable, strong, lightweight, durable, and attractive. With molded wood, fiberglass, plastic, and lightweight metals, products are available in form and finish of exceptional merit.

Art Values

Worthwhile pictures, statues, or other art forms offer an opportunity to direct the taste and provide pleasure. A carefully selected group of paintings, displayed in rooms throughout the school, constitutes a subtle introduction to art appreciation. Prints of large size and good color are available at low cost.

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[4] "Glass, the Controversial School Building Material," American School Board Journal, July, 1960, p. 23.

Art Selection

In the selection of pictures, the age of the viewers should be considered. Action, adventure, and bright color appeal to young children, while older students are less concerned with subject matter and more conscious of technique. Syrupy sentiment in subject matter, too often found in schoolrooms, should not take precedence over good art. Pictures should be selected by qualified people.

As possible selections, twenty paintings are suggested. The first ten should especially appeal to younger pupils.

Selected Paintings

Suitable pictures for classrooms are:

1. *Mont Sainte Victoire* by Cezanne
2. *The Polish Rider* by Rembrandt
3. *View of Toledo* by El Greco
4. *Two Girls at the Piano* by Renoir
5. *Windmills of Montmartre* by Utrillo
6. *Harbor at Deauville* by Dufy
7. *Tahitian Landscape* by Gauguin
8. *Oleanders* by Van Gogh
9. *Last Supper* by Leonardo
10. *The Dancing Class* by Degas
11. *An Afternoon at LaGrande Jatte* by Seurat
12. *Flood at Port-Marly* by Sisley
13. *Christ with Mary and Martha* by Tintoretto
14. *The Washerwoman* by Daumier
15. *At the Moulin Rouge* by Toulouse-Lautrec
16. *The Old Guitarist* by Picasso
17. *Portrait of Ippolito Riminaldi* by Titian
18. *Snow-Storm* by Turner

19. Philip IV: The Fraga Portrait by Velazquez

20. The Milkmaid by Vermeer

Music

Carefully chosen recordings, together with a communication system incorporated into the school building, provide another rich educational experience. As with paintings for school viewing, this is an opportunity to combine appeal with cultural value. Admittedly, this entails an expenditure which may not be justified within some budgets. Records might include works by composers strong in melody, such as Tschaikovsky, Grieg, Ravel, Debussy, Strauss, and Chopin.

Use of Public Address System

Music before school, with meals, and at other times would increase pleasure and learning for students and faculty. In conjunction with radio, the communication system may also provide extra programs. Ballet, opera, and drama become potential classroom listening.

Summary

A positive philosophy of aesthetics may in two ways, apart from the curriculum, provide advantages for students and an improved environment for the staff. One benefit is the added incentive to learning which accompanies a physical plant designed and maintained for pleasant learning situations. The other advantage is the growing appreciation of beauty which will result from constant experiences with tasteful surroundings.

To increase the emphasis on aesthetics in the school plant, the administrator should utilize the services of an architect whenever practicable, and should at all times seek to initiate changes conducive to improving the plant and the environment of those who attend.

"In the years ahead we will look back on the '50's as an era in which dramatic changes took place in public school architecture. This will be partly because great changes occurred in our educational programs, but also the architects and school planners became people of ability, wisdom and vision, realizing that aesthetic values add immeasurably to the learning experience of youth."[5]

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[5] James F. Redmond, Superintendent of Schools, New Orleans, La., Excerpt from Address to Schoolhouse Conference, Austin, Texas, March, 1961.

Suggested Readings

American School Building, American Association of School Administrators, Washington, D. C., 1949. Discusses many aspects of the school building program.

Caudill, William W., Toward Better School Design, F. W. Dodge Corporation, New York, 1954. One of the foremost architects of the nation discusses problems relative to school design. This book is interesting, informative, and readable. It also contains many case studies offering solutions to specific problems.

Caudill, William W., and Thomas A. Bullock, Some Thoughts Concerning Beauty. Brochure by Caudill, Rowlett and Scott, Architects, Houston, Texas, June, 1960. Points up the relation of beauty and function in a most instructive and entertaining manner.

Englehardt, N. L., N. L. Engelhardt, Jr., and Stanton Leggett, School Planning and Building Handbook, F. W. Dodge Corporation, New York, 1956. Serves as a guide for the school building program and anticipates most problems to be encountered.

Giedion, Sigfried, Space, Time and Architecture, The Harvard University Press, Cambridge, Mass., 1947. Traces the development of modern architecture.

"Glass, the Controversial School Building Material," American School Board Journal, July, 1960, p. 23. Discusses the pros and cons of using glass in school building construction.

Graves, Maitland, The Art of Color and Design, McGraw-Hill Book Company, Inc., New York, 1941. Clearly presents principles of design and offers specific information, a rare thing in books on art. This is highly recommended.

Lopez, Frank G., et al., Schools for the New Needs: Educational Social Economic, F. W. Dodge Corporation, New York, 1956. From the pages of Architectural Record, this is a valuable grouping of elementary and secondary school design, with a section on cost studies.

MacConnell, James D., Planning for School Buildings, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1957. Introduces some of the considerations for school planning, including needs.

McQuade, Walter, editor, Schoolhouse, Simon and Schuster, New York, 1958. Covers many problems confronting the educator engaged in a building program. A highlight of the book is a section containing beautiful, colored, serial photographs of schools.

Swinburne, Herbert, A.I.A., Philadelphia, Pa., School Planning, Volume 5, Number 1, 1960, p. 2. Presents a case for planning art, in all its forms, into a school building.

Teague, Walter Dorwin, Design this Day, Harcourt, Brace and Company, New York, 1940. Offers readable commentary on beauty.

CHAPTER VIII

FUNCTIONAL PLANNING AND DEVELOPING OF SCHOOL GROUNDS

The total configuration of the school campus as it first meets the eye--buildings, lawns, shrubs, trees, parking areas, playgrounds--this is the province and the scope of school plant management with regard to the beautification and maintenance of the school landscape. This chapter will deal with the larger segment of the school plant, the grounds, and with the development of the setting in which the school buildings are placed.

Planning

The grounds should be as carefully planned as the school buildings. The ideal school ground will be extensively planted to create a park-like effect.[1]

The initial phase of management of the school grounds is planning, and the first step in planning is to consider the over-all aspects of the program. This begins with the physical features of the land upon which the school is or will be located.

Location of Site

Essentially, the school site is accessible to the public it is designed to serve. Main access streets are adjacent to the campus; major thoroughfares are not in close proximity. City transit services can be provided if necessary, and school buses are provided ample room for transit and loading. Utilities services can be readily supplied, and any large industrial plants in the vicinity are far enough removed that noise or noxious fumes are not a problem.

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[1] School Grounds, Their Planning and Planting, Bulletin 189, Department of Agricultural Extension, Purdue University, Lafayette, Indiana, p. 3.

Beyond these primary considerations, the grounds planners must accept the site as an artist looks at his canvas and visualizes what the painting is to be.

Size of Site

The size of the planned or existing campus concerns the landscape artist, who must envision play areas, athletic fields, apparatus areas, parking lots, walks, entrances, etc. He also must plan for trees, shrubs, fences, walks, streets, and lawn acreage. It also concerns budgeting for maintenance of the campus, over and above initial costs of procurement and original development. In this wise, centralization of facilities will reduce area, provide for multiple use, and reduce the costs of grounds development and maintenance.

Terrain

A gently rolling terrain for the greatest percentage of facilities would present less expensive cost of development and maintenance than would a totally steep or totally flat terrain. A balance of sixty per cent rolling, twenty per cent hilly, and twenty per cent flat terrain would provide aesthetic appeal and interest and would fall in the range of practical development.

Landscape Planning

Much to be desired among the planners of a school is a landscape architect, experienced in school design and familiar with the indigenous characteristics of the locale.

A landscape specialist is employed primarily to study the land, recommend its utilization for all desired facilities, and design the desired facilities, excepting the buildings and utilities. On some problems, the landscape architect and the architect must work together; in specifically designated interests, they work separately. Planting plans often require several years to materialize into a complete composition. Even so, the landscape specialist will draw landscape plans and will effect their realization over a staggered period of time, with a flexibility necessitated by plant maturation or by a limited outlay of funds.

In his landscape planting plan, the designer will have achieved the greatest initial developments in beautification if he has scheduled the immediate construction of a beautiful lawn and the planting of choice shade trees and flowering trees. Fundamentally, if he were to include no other plants he would have the basis for the most economical, practical, and beautiful planting plans that can be applies to school physical plant development.

Public taste and sentiment, however, usually demand that shrubs, flowers, vines, hedges, ground covers, etc. be included in landscaping plans. They have aesthetic appeal and are justifiable in educational values. A beautiful lawn, shade trees, and flowering trees will necessitate an expenditure for permanent maintenance. The inclusion of shrubs, flowers, etc., will increase the unit maintenance. Lawns and trees are relatively easy to maintain. Added plants require more individual attention.

The over-all landscape picture should include the buildings, drives, covered and open walks, planting arrangements, surfaced and unsurfaced recreational areas, parking areas, surface and subsurface utilities, fences and hedges, screens and walls, patios and courts, and other features which contribute to the utility and beauty of the school campus.

Organizing the Program

In small, single campus schools, the superintendent may assume, among his many other duties, the management of the program of grounds development and maintenance. However, he may delegate this responsibility to his custodial-maintenance supervisor. In large school systems, generally a person is designated as director of the physical plant, or as grounds maintenance supervisor. He is, because of his direct responsibility to the superintendent, a permanent administrative assistant.

The Grounds Supervisor

Regardless of the size of the school or the title of the office, there is one person in each school who is responsible for implementing the plans presented to him for the development and maintenance of the school grounds. For convenience, we shall hereafter refer to this person as the grounds supervisor.

The numerous tasks of the grounds supervisor may be summarized as follows: (1) organizing and training a labor force, (2) selecting equipment and tools, (3) building and maintaining lawns, (4) planting trees and shrubs, (5) using fertilizers, and (6) controlling plant diseases and pests.

The first two of these tasks will be detailed below. The latter responsibilities will be taken up in Part III, which follows this discussion.

The Labor Force

In selecting workmen, the grounds supervisor must bear in mind that most grounds operations are done outdoors in all weather. Regardless of weather conditions, certain operations will have to be done, even though some work may be curtailed.

In large school systems, foremen for various areas may be employed. A foreman must have experience and knowledge of the diversified jobs which he will be assigned. He must perform his services efficiently, economically, and quickly. He must be alert to more economical and effective work methods and should be able to train other employees.

The ideal grounds maintenance employee is one who enjoys working outdoors, who loves the earth and green, growing things, who appreciates nature, and who takes pride in the neatness and beauty of the grounds. Of course, he must be healthy and sturdy and know tools and how to use and care for them. He must be intelligent enough to learn good techniques and to follow orders closely.

This person is not difficult to find nor to train. On the Texas Gulf Coast, among the native Negroes and Latins, there are many such laborers with a touch of the landscape artist in their make-up, who will make diligent, devoted, and painstaking workers, provided thoughtful selection procedures are employed. (Chapter II contains some suggestions on personnel policies.)

Selection of Equipment and Tools

The grounds supervisor must provide himself and his work force with equipment and tools. It must be assumed that he has been provided building space from which to direct and supply all grounds operations.

In acquiring equipment, he bears in mind that he has many diversified operations to perform. He must choose equipment that is capable of performing many operations. For instance, if among other areas he is required to mow a five-acre playing field, he would not buy a riding power mower which would require five to six hours to mow the field. He would buy a tractor and a mower attachment. The tractor with mower attachment would mow the same area in two hours and be released to mow another area. Too, the tractor and operator could be released to another job. With the same efficiency in mind, the grounds supervisor would acquire all the labor-saving attachments for the tractor that would assure economical performance of different jobs.

Tools acquisition must be dealt with in the same manner as procuring equipment--select the tool that can be efficiently used for the most jobs. Grounds tools are somewhat standard in the applications for which they are designed. However, much of the hand-tool, manual labor type of work can be done more quickly, efficiently, and economically with power tools. The gasoline powered chain saw can replace the hand crosscut or ripsaw in tree work. A gasoline powered edger-trimmer can replace the hand grass shears. Power hedge trimmers replace the hand hedge shears. The tractor-mounted curb and sidewalk edger obviates the tedious labor of chopping turf and weeds with a hoe. The power cultivator should replace the back-breaking spading fork wherever possible. Power tools of many types can be utilized to outmode and outsave costly manual labor apparatus. These are just a few examples. There are numerous other savings to be made by the grounds supervisor, depending on his imagination and ingenuity.

In some cases, hand tools are more practical than power tools, but the selection of one type over another is advantageous. For example, in a stopped-up ditch, a shovel would be used to effect better flow of water. In planting clumps of sod in a new lawn, a shovel would also be used. Labor, time, and money would be saved on both jobs by using a sharpshooter, sometimes called a drain spade.

The grounds supervisor, through careful study and operation, can modernize many areas of effort, utilizing equipment and tools. There is a piece of equipment or a tool available to him with which any job can be performed more efficiently. It is up to him to discover and to apply these devices.

Developing School Grounds

The proper scope of the term "grounds" in this treatment refers to that area of the school campus generally classified as lawn. This discussion will confine itself to the development of grounds areas as to soils, grasses, trees, and shrubs, the fertilization, irrigation, and drainage of lawns, and the control of plant diseases and pests.

In the establishment of turf, there are three distinct steps to be taken: (1) preparation of the soil, (2) establishment of the grass, and (3) care and maintenance of the turf.[2]

Soil Preparation

Soil is the foundation of the lawn. As with any structure, the end product is no better than the foundation upon which it is built. The first step in preparing a new turf area is to remove all debris from the soil.

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[2] Home Lawns, Bulletin 203, Texas Agricultural Extension Service, Texas A. & M. College, College Station, Texas, p. 5.

The character of the native soil should be studied for its adaptability to a selected lawn grass. A sandy loam, high in organic matter, is considered most satisfactory for turf. A highly sandy soil should have clay or loam added. If a soil is clayey, some sand should be thoroughly mixed into the clay. In all cases, organic matter should be added. Peat, rotted leaves, well-rotted hardwood sawdust, and similar materials can be applied. This mixing may be done by repeated plowing and disking.

Terraces should be avoided, if possible, because of the difficulty of establishing and maintaining turf on slopes. Retaining walls should be built to avoid terracing. When trees exist in the lawn area, soil should be sloped gently away from the base of such trees. If a fill of more than a few inches is needed around trees, a retaining wall should be constructed to prevent covering tree roots too deeply.

The final step in soil preparation is the final grading. Previous watering will have dissolved clods and firmed the seed bed. Harrowing and raking will pulverize and aerate the surface, and will remove hard clods and stones which may have worked up to the surface. Depressions may have appeared due to settling. These may be filled, and high places smoothed down. Walks and driveways should be flashed with the final surface.

Drainage

Drainage of grounds is of two types, subsurface and surface drainage. Subsurface drainage should be provided by a sufficient thickness of topsoil so that excess water will percolate away from turf, or by installing subsurface drain tile. Surface drainage can be effected normally by providing sufficient slope to the [illegible] off excess water without washing away soil in which the lawn grass is to grow.

Grounds should slope away from buildings, walks, driveways, etc. Large playground areas should be higher in the center, sloping toward the perimeter. A fall of one inch in 40 - 50 feet is enough for drainage, provided no depressions exist.[3]

Drainage is a problem on the Texas Gulf Coast, where heavy rainfall often taxes the capacity of drainage systems and flooding is common. Large drainage ditches and canals combat this problem. Also serviceable are drainage basins, or underground tanks, equipped with sump pumps. These may discharge into storm sewers or drainage canals.

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[3] _Ibid._, p. 6.

Irrigation

Although the Texas Gulf Coast is bountifully supplied with moisture, one cannot control the amount nor the timing of the natural rainfall. Therefore, any system of grounds maintenance, even in this area, must include a lawn irrigation system, even though it be a few spigots to which water hoses may be attached for watering lawns, trees, and other areas. Ordinary spigots which demand use of water hoses are not always practical as an irrigation media. If the initial construction budget can provide a subsurface lawn irrigation system, it should be installed. If the system so installed will not be adversely affected by soil chemical conditions, soil movement and mechanical disruptions, and freezing temperatures, it should last for twenty years or more, with nominal maintenance.

Lawn irrigation systems utilize main and lateral water lines beneath the surface of the ground. The depth of these lines will depend on the necessity to protect the system from freezing. At specified intervals, fittings are installed on these subsurface water lines. There are two types of surface fittings, both of which are at ground level and present no hazard to mowing equipment. One of these devices utilizes a pop-up water release and spray system governed by main valves which control a certain number of sprays. The second type employs a pressure release type snap-on valve. Portable sprinklers may be placed on any snap-on valve, and each sprinkler has its own lever to release water through the valve.

Another type of watering system is a perforated plastic pipe buried beneath the surface of the ground. Water pressure forces water out of the perforations, soaking the subsurface soil.

Fertilizing

The low cost, effectiveness, and lasting qualities of commercial fertilizers have almost outmoded barnyard manure, except for small areas, such as flower beds.

In establishing a new lawn, the lawn builder must choose the chemical fertilizer best suited to the type of soil with which he has to work. The Texas Agricultural Extension Service, through its County Agricultural Agents, will furnish soil analysis and lawn care advice, upon request.

Fertilizers must be worked deeply into the soil to a depth of eight inches or more, by plowing, spading, or disking. The lawn area is then smoothed by harrowing and dragging. It should be watered thoroughly to dissolve and distribute the fertilizers and dragged again as soon as dry. With the final dragging a starter fertilizer may be applied, if desired. The soil is now ready for planting.

Grasses

Whether the lawn is to be started by seeds, sprigs, or clumps of sod, is dependent on choice and the geographical conditions of the locality. Choice of a turf depends on the geographic location of the property, the amount of water available for irrigation, the degree of shade present, and the kind of use anticipated.

If the chosen grass may be established by seeding, this is the most economical manner of turf propagation. After seeding, the soil must be kept moist until a good stand of grass appears.

Sprigging is used for grasses which cannot be grown from seed. Lawns may be sprigged at any time during the growing season when adequate moisture is available, preferably early in the season.

Sodding, due to the high cost involved, is not recommended unless there is immediate need for complete coverage.[4]

According to the Texas Agricultural Experiment Station, of the 550 species of grass in Texas, only a few are suitable for turf.[5] Turf grasses are classified as warm-season (growing in late spring, summer and early fall) and cool-season (growing in late fall, winter and early spring). Warm-season grasses most often used and recommended for turf purposes on the Texas Gulf Coast are Bermuda and St. Augustine. Zoysia and centipede are other warm-season turf grasses. Cool-season grasses grown in parts of Texas are ryegrass, fescue and Kentucky bluegrass.

Common practice in areas of [illegible] (a fast grower) in fresh soil, to lessen the probability of erosion. Permanent grass is planted at the same time and emerges later. Ryegrass, often called "winter" grass, should not be seeded too heavily, as to crowd out the desired permanent grass. It works well with Bermuda, giving the lawn more green color in the winter season. St. Augustine will crowd out most other grass types, including rye.

Watering

Newly established turf areas must be watered lightly and frequently enough to prevent the surface from drying. As grasses begin to take root and grow, the frequency of watering should be reduced and the amount of water applied increased. This permits the development of a deep root system and ultimately reduces the amount of water needed.

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[4] Ibid., p. 7.

[5] Ibid., p. 1.

Lawns should never be watered until the grass shows a definite need.[6] Grass suffering from lack of moisture takes on a definite sheen and the plants wilt and curl. When this occurs, the lawn should be soaked thoroughly to a depth of six inches or more. Apply water only as fast as the soil can absorb it. Light sprinklings are never recommended except during excessively hot spells following a period of heavy rainfall. Light daily sprinklings during this time reduce scalding.

Aeration

Soil compaction is a major problem where the turf is subject to wear. This condition may be corrected by aerification--making small holes in the topsoil. An effective hand-tamp type of aerifier is made from a short piece of 2 x 6 board, with 40-penny spikes driven through it. A 2 x 4 handle is added for portability, and power is furnished by standing on the board. Power aerators are available for large areas, such as athletic fields.

Mowing

Improper mowing is responsible for the deterioration of many lawns.

Lawn grass can be mowed too often and too short. It is best to experiment with settings on the height of mower blades, since different types of grass, in different localities, with varying degrees of moisture and nourishment make it difficult to apply set rules to the problem. However, a turf height of not more than two inches is advisable for most grass types. Mowing too close encourages thinning of the turf and shallow rooting, resulting in lowered resistance to drouth, diseases, and invasion by weeds. Clipping too high results in many of the same problems. Mowing too close also allows excessive soil drying, baking, and heat damage to grass during the summer.

Grass leaves not only produce the desired green color, but they are necessary for the manufacture of food required by the entire plant. When too much of the leaves is clipped off, the entire plant suffers. Removing two inches or more at one mowing is a severe shock to turfgrass. The grass should be mowed often enough that not more than one inch of the leaf tip is removed at any one clipping.[7]

Regularity--in mowing, trimming, and watering--is the secret of good lawn care. Lawn grass seems to accustom, or adapt, itself to a routine, even as does its keeper.

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[6] *Ibid.*, p. 10.

[7] *Ibid.*, p. 11.

CHECKLIST FOR PROPAGATION OF LAWN GRASSES

Types of Grasses	Established From	Method of Planting	Quantity per 1,000 Square Feet	Best Planting Season
Bermuda	Seed	Broadcast	1/2 - 1 pound	Spring ad early fall
	Sprigs	6" apart in 12" rows	5 - 10 square feet sod	
	Sod	Solid, lay as bricks	Same as area to be sodded	
St. Augustine	2" sod blocks	2" blocks on 12" centers	30 square feet nursery sod	Spring ad early summer
	Runners	On 12" centers	3 - 6 square feet nursery sod	
Centipede	Sprigs or 2" sod blocks	8" rows, 12" apart	5 - 10 square feet nursery sod	Spring and early fall
Zoysia	Sprigs	2" apart in 6" rows	40 - 45 square feet nursery sod	Spring and early summer
Ryegrass	Seed	Broadcast	6 - 8 pounds	September to November
Fescue	Seed	Broadcast	6 - 8 pounds	September to November
Kentucky Bluegrass	Seed	Broadcast	1 1/2 - 2 pounds	September to November

Source: Home Lawns, Texas Agricultural Extension Service, p. 3.

Weed Control

Weeds are generally the product of neglect. Proper turfgrass management is the best means of controlling weeds. When the right grass is used and properly established, fertilized, mowed, and watered, weeds are rarely a problem.

When weeds are few and scattered, hand tools can remove the weeds and the roots. Should weed patches spring up, as along border areas, chemical weed killers may be used to advantage. The type of chemical depends on the type of weed.

Texas Agricultural Extension Service Leaflet 425, "Chemical Weed Control in Lawns," gives full details on the use of chemicals for the control of lawn weeds. Your County Agricultural Agent has this information.

Disease Control

Diseases affecting lawn grasses are mostly of a fungus variety. Lawns which are properly maintained seldom suffer from these ailments. Proper mowing, watering, fertilization, and aeration are the best insurance against "sick" turf.

Brownpatch is a fungus disease that attacks St. Augustine and Bermuda grasses. The disease may be controlled by spraying the affected and surrounding areas with Terraclor and other fungicides, used according to the manufacturer's directions.

[illegible] fungus diseases affecting lawn grasses. Slime mold can be washed off grass leaves by a power spray of 20-30 pounds pressure. Gray leaf mold results from lack of moisture and can easily be corrected by slow soaking. Fairy ring (a dark green circular patch of turf) results from a fungus in the soil. This condition can be corrected by wetting the soil deeply with a mixture of two ounces of common household detergent per five gallons of water.

Leaf spot is a series of fungus diseases which attack bluegrass, St. Augustine, and Bermuda. Cool, wet weather of early spring favors this fungus growth. Avoid applications of fertilizer and close mowing in damp weather during April and May. If the disease is noted, spray the lawn during this period with Actidone or PMAS. The directions for application are on the container.

Insect Control

There are many different species of insects which infest lawns, shrubbery, and trees. These pests are far too numerous to mention in this limited treatment. For specific information on insect control recommendations, the reader is referred to Leaflet 199, "Texas Guide for Controlling Insects on Ornamental Plants," available from a County Agricultural Agent, or from the Agricultural Extension Service, Texas A. & M. College, College Station, Texas.

Mounds built by crayfish often plague groundskeepers in coastal Texas. A handful of unslaked lime in the home will discourage old "craw-dad" from disfiguring the lawn.

Trees and Shrubs

In the initial functional planning of grounds, the acquisition of selected trees must be studied. These may be acquired directly from woods, fields, bottoms, etc. In acquisition of this type, successful results may be assumed at not over 50 per cent, even under expert attention and optimum conditions. Cost of digging, balling, loading, hauling and planting may become rather high if only 50 per cent success is attained.

A second method of acquiring trees is by direct purchase from a local firm. The purchase may be made for the trees and their planting, or it can be made for the trees delivered to and unloaded at the site, the planting to be done by school personnel.

When contracts are made with a local firm for the trees and their planting, the responsibility of specifications, supervision, and contract stipulation may require that the firm maintain the trees for a limited time and replace trees that have died during that time. Although expensive, this method of procurement is most satisfactory when dealing with a reliable local firm.

Gifts of trees are a third source of procurement. When organized groups will finance the purchase and delivery of desired trees to the planting site, the school should consider the offer, but when groups or individuals offer single trees, the offer should be carefully weighed as to planned needs and costs in terms of time, labor, etc.

The most majestic and valuable shade tree to adorn the grounds of Texas schools is the live oak. It is an evergreen, relatively free from disease, probably the most long-lived of our trees, and once mature, requires very little maintenance.

Perhaps the best, fastest growing oak tree in the coastal Texas area is the water oak. Although it is deciduous, it has a rapidity of growth and grace that justify its recommendation for widespread planting to give shade and beauty.

The willow oak, locally referred to as pin oak, is another rapidly growing tree, deciduous, and not as long-lived as the live oak and water oak.

Numerous other shade trees, evergreen and deciduous, are available in the Gulf Coast area. Some popular, fast-growing, deciduous varieties are the tallow tree, sycamore, cottonwood, and Siberian elm. Slow-growing deciduous trees include the hackberry, American elm, and pecan. The stately evergreen magnolia is a perennial favorite.

Several interesting ornamental flowering trees are available including the retama, redbud, catalpa, tulip tree, and fruit trees, such as plum, pear, and peach.

A large variety of shrubs, too numerous to mention here, evergreen or deciduous, flowering or fruiting, embellish home lawns and school grounds. Vines, ground covers, annuals and perennials, and countless other plants of interest contribute to the plethora of verdant splendor of the Texas Gulf Coast region. Whether they should or should not be planted is a matter for study and consideration.

Aesthetic Considerations

Features of aesthetics exist in the natural state throughout Texas. It remains but for the people of a locality to utilize their particular aesthetics. Be the area anywhere in the state--mountain hill, desert, plain, woods, or water--the elements of landscape beauty exist. Stone, water, sand, forest, river, creek, lake, caliche, clay, black land, salt flat, gumbo--each contributes its own particular beauty, according to the sensibilities of the local citizenry.

Effective aesthetic appeal is acquired with minimum movement use of non-indigenous materials.

It is important to recognize that the degree of beauty created will depend on the amount of human effort and material, expressed in dollars and cents, expended toward that degree initially and contributed toward that degree perpetually. Shortsighted public impatience for immediate beautification of grounds should not deter the development of the program. Nature works slowly. Too, funds may limit immediate realization of plans, but careful management will apply available monies over a long period, keeping in mind that grounds maintenance costs are as important as costs of original procurement and development. Aesthetics are synonymous with careful attention to detail.

The atmosphere of a beautiful school setting appeals to the conscious and subconscious mind of adult and child alike. It creates a feeling of being a part of the school. It develops a sense of esteem for the creation. By the very sights, sounds, and smells, a beautiful school campus creates a wholesome learning environment. In our hurrying, workaday lives, it is not too much to ask ourselves to dedicate our time, money, and natural resources to creating beautiful schools for our children, wherein they spend most of the active and impressionable years of their childhood.

Summary

The total configuration of the school campus is the province of school management as it refers to planning, developing, and maintaining school grounds.

In planning school grounds, professional advice should be sought. A landscape architect considers site location, size of site, and type of terrain. He analyzes the chemistry of the soil, assesses the geographical conditions of temperature and rainfall, and ponders the use of indigenous plants in the planting scheme. He considers and plans for all physical grounds features--lawns, shrubs, trees, flowers, fences, hedges, walks, courts, playgrounds, athletic fields--and other features which contribute to the utility and beauty of the school campus.

There is one person in each school district who is responsible for implementing the plans agreed upon by the school board. This person is referred to in this text as the grounds supervisor. He is responsible for organizing and training a labor force, for selecting equipment and tools, and for developing and maintaining the school grounds. These tasks are outlined in this chapter.

The aesthetic effect created by thoughtful planning and astute management may be limited by the funds available for initial development and for perpetual maintenance of the school grounds. This chapter closes with an appeal to an enlightened society to give not only money, but its finer emotions to the enhancement of the educational environment of our children.

Suggested Readings

Berger, Arthur S., "Planning and Planting," Texas Architect, March, 1960, pp. 8-9. Offers some interesting ideas on campus beautification.

Chemical Weed Control in Lawns, Leaflet 425, Texas Agricultural Extension Service, Texas A. & M. College, College Station, Texas. Outlines methods of weed control by application of commercial chemicals.

Conover, H. S., Grounds Maintenance Handbook, F. W. Dodge Corporation, New York, 1958 (Second Edition). Presents an extensive treatment of all phases of grounds maintenance.

Edmond, J. B., A. M. Musser, and F. S. Andrews, Fundamentals of Horticulture, The Blakiston Company, New York, 1951. Contains a wealth of ideas on horticulture out of courses taught in Mississippi State College, applicable to the Gulf Coast region of Texas.

Forest Trees of Texas, Bulletin 20, Texas Forest Service, Texas A. & M. College, College Station, Texas. Furnishes practical data on native Texas trees.

Home Lawns, Bulletin 203, Texas Agricultural Extension Service, Texas A. & M. College, College Station, Texas. Provides complete and concise details for lawn establishment and maintenance.

Johnson, E. W., Ornamental Shrubs for the Southern Great Plains, Farmer's Bulletin 2025, U. S. Department of Agriculture, 1951. Provides horticultural information pertinent to most of Texas.

Musser, H. Burton, Turf Management, McGraw-Hill Book Company, Inc., New York, 1950. Suggests practical answers to turf problems; written especially for golf course maintenance, but admirably applicable to the school campus.

Ornamentals for Southwest Texas, Bulletin 695, Texas Agricultural Extension Service, Texas A. & M. College, College Station, Texas. Gives specific information on native trees and shrubs.

Robbins, Wilfred W., Alden S. Crafts, and Richard N. Raynor, Weed Control, McGraw-Hill Book Company, Inc., New York, 1952. Deals

School Grounds, Their Planning and Planting, Bulletin 189, Department of Agricultural Extension, Purdue University, Lafayette, Indiana. Affords a brief, concise outline for the development of school grounds, urban and rural.

Strauss, Rodney J., "Is Our Present Method of Watering Turf Wasteful?" American School Board Journal, March, 1952. Points out popular fallacies in turf maintenance and suggests practical methods.

Texas Guide for Controlling Insects on Ornamental Plants, Leaflet 199, Texas Agricultural Extension Service, Texas A. & M. College, College Station, Texas. Deals with control of most insects known to infest Texas ornamental plants.

CHAPTER IX

PLANT UTILIZATION

The school plant is designed to accommodate the instructional program planned for an anticipated pupil enrollment, and, in contemporary practice, is also planned to serve certain community functions, especially in smaller towns with limited public facilities. Proper utilization of plant facilities is a prime means of effecting economies in the total school operation.

In programming for optimum utilization, the school administrator needs to do three things: (1) inventory existing plant facilities and their capacity, (2) study alternative ways of in-

Measuring Capacity

The administrator, before planning for maximum potential utilization of the school plant, needs to survey and classify all spaces available to the educational program:

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[1] W. H. Strevell and Arvid J. Burke, *Administration of the School Building Program* (New York: McGraw-Hill Book Company, Inc., 1959), p. 149.

CHECKLIST FOR CLASSIFICATIONS OF SPACES

Instructional spaces

- Classrooms

Auxiliary spaces

- Library
- Laboratories
- Music (band, choral)
- Vocational shops
- Home economics rooms
- Art room
- Audio-visual rooms
- Gymnasium

Utilitarian spaces

- Foyers
- Lobbies
- Corridors
- Stairs
- Rest rooms
- Sick room

Supporting spaces

- Auditorium
- Cafeteria
- Offices
- Storage rooms
- Maintenance shops, storage
- Custodial spaces
- Transportation shops, garages, storage
- Stadium
  - Grounds
  - Seating
  - Dressing rooms
  - Storage rooms
  - Press box
- Playground areas
- Apparatus areas
- Open courts, patios
- Parking areas
- Loading zones

Capacity Defined

The existing plant capacity may be defined in terms of (1) normal capacity, (2) emergency capacity, and (3) functional capacity.

Normal capacity refers to whether or not a room can be used for regular classes, according to the normal class size (25-30 pupils) of the school program. The maximum load that can be accommodated at any one time in a normal working day is the normal capacity. The normal operating capacity must be set on a basis that will assure good educational results, and at a level below the emergency capacity to allow for normal fluctuations.

Emergency capacity is legal maximum capacity and is mandated by existing health and safety standards. It refers to local and state codes with respect to public assembly including public schools, and pertains to classrooms, corridor width, fire escapes, stairways, ventilation, etc.

Functional capacity is more meaningful than any other measure, since the true value of space lies in its relation to the educational product. Vocational shops, library, conference rooms, sick rooms, gymnasium, music rooms, and other special spaces do not lend themselves to traditional capacity measurement. Also, the trend toward use of guidance counselors, remedial teachers, accelerated classes, and team teaching techniques, make it imperative to provide working space for these staff members.

Often school buildings have several organizational uses. Parts of buildings may house administrative departments or public meeting rooms, in addition to regular school facilities. It is not logical to ignore such areas in making a capacity inventory. They may be listed as contingency capacity to be converted to regular school use in an emergency.[2]

Utilization Measurements

Two common measures of plant utilization are: (1) space utilization, and (2) pupil (enrollee) utilization. The former is concerned with group areas--classrooms, gymnasiums, etc. If a room is occupied five periods of a six-period day, it shows an 83% usage. If the same room has 30 pupil stations (desks) and teaches an average of 28 students for the five periods it is utilized, it shows a 77.7% usage, using the pupil-station to attendance ratio. Of the two approaches, the latter provides a truer index.

TYPICAL SQUARE-FOOTAGE STANDARDS[3]

Type of Room	Square Feet per Pupil Station	Minimum Area In Square Feet
Elementary classroom	30-35	950
Kindergarten	40	1200
High school recitation rooms	18-25	---
Science laboratories	30-40	---
Homemaking	40	1200
Business education	35	---
Art	30-35	---

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[2] Strevell and Burke, op. cit., p. 139.

[3] Strevell and Burke, op. cit., p. 134.

Type of Room	Square Feet per Pupil Station	Minimum Area In Square Feet
Music	25	---
Industrial arts	50-75	1500
Agriculture	75-100	1500
Reading rooms	25	---
Dining area	15	---

It should be pointed out here that the square-footage yardstick is too rigid for total estimation purposes. One must consider supporting spaces (circulation, rest rooms, offices, storage, and custodial spaces, etc.) in assessing space requirements.

Procedures for Estimating Capacity

1. Decide upon the educational program to be housed in terms of grouping children, conducting activities, and providing services.

2. Adopt standards as to the square-footage space needs per enrollee for each of the anticipated group activities or special services. These standards may be such as suggested above, which are minimal and flexible.

3. Develop a reasonable plan of scheduling the activities in terms of period of time, so as to distribute the pupils evenly as possible throughout the plant.

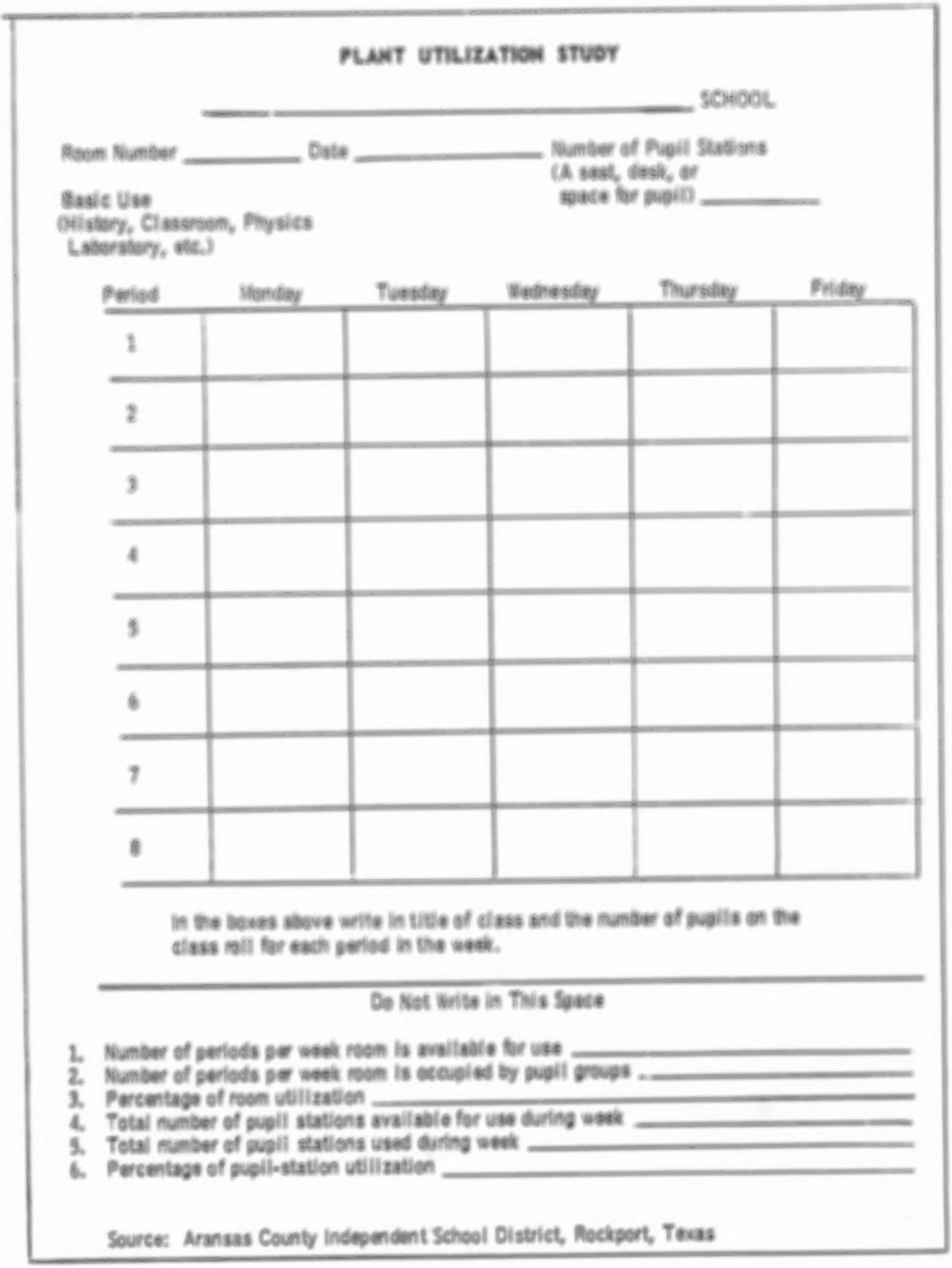
4. Assign a functional value to all spaces that are available.

5. Designate areas that contribute only partially or not at all to total pupil capacity, i.e., spectator seating.

6. Develop all opportunities for multiple use of special spaces to achieve full-time and full-capacity utilization.

7. Determine by use of codes the emergency capacity of each space.

8. Note any possibility of contingency capacity.



PLANT UTILIZATION STUDY

______________________________ SCHOOL

Room Number __________ Date _______________ Number of Pupil Stations
(A seat, desk, or
space for pupil) __________

Basic Use
(History, Classroom, Physics
Laboratory, etc.)

Period	Monday	Tuesday	Wednesday	Thursday	Friday
1					
2					
3					
4					
5					
6					
7					
8					

In the boxes above write in title of class and the number of pupils on the class roll for each period in the week.

Do Not Write in This Space

1. Number of periods per week room is available for use __________
2. Number of periods per week room is occupied by pupil groups __________
3. Percentage of room utilization __________
4. Total number of pupil stations available for use during week __________
5. Total number of pupil stations used during week __________
6. Percentage of pupil-station utilization __________

Source: Aransas County Independent School District, Rockport, Texas

Plant Utilization Study Form

Figure 7.

Increasing Plant Utilization

The administrator planning for a higher degree of utilization should determine the number of pupil-stations available, as to classroom, library, laboratories, visual-aid rooms, shops, gymnasium, playground areas, etc., and estimate the number of pupils who will be served in and by these locations. Minimum standards for area and facilities have been scientifically determined for the administrator's use.[4]

Advance registration of pupils for certain subjects and activities will be an accurate indicator of utilization problems. With these data, the administration can arrange groups to spaces and times available, and work out a maximum utilization program.

Multiple Use of Space

Since many facilities of a modern school plant are specialized in function, adjustments can be made to allow use of the spaces for a variety of purposes.

Following are some special combination areas by which a higher rate of plant utilization might be realized:

Gymnasium-auditorium

Gymnasium-cafeteria

Auditorium-cafeteria

Auditorium-band or choral room

Library-study hall

Stage-music room

Audio-visual-little theatre-music room

Board room-conference room

Cafeteria-study hall-large group testing

Cafeteria-playroom

Teachers' lounge-sick room

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[4] *Guide for Planning School Plants*, National Council on Schoolhouse Construction, Peabody College, Nashville, Tennessee, 1958, p. 6.

BY..............DATE.......... SUBJECT.. SHEET NO..........OF..........
CHKD. BY........DATE.......... .... JOB NO..........................
....

PLANT CAPACITY INVENTORY

BUILDING (or Area): ______________________ Date: ______________________

Space	Function	Square Feet	Normal Capacity	Emergency Capacity	Per Cent of Use	Comments

By: ______________________

Plant Capacity Inventory Form

Figure 8.

Homemaking-classroom

Vocational shops-classroom

Science laboratories-classrooms

Custodial space-darkroom (photography)

Lengthening School Day and Week

Economies may be realized by scheduling each teaching station for use during a greater portion of the school day. Extending the school day and the school week, both for regular students and for adults, will result in more economical and complete utilization of the school plant. Double sessions, and overlapping sessions (e.g., 7:00 a.m.-1:00 p.m., 11:00 a.m.-5:00 p.m., 3:00 p.m.-9:00 p.m.), although not popular with school patrons, do not significantly hamper pupil achievement and have long been used by schools and the Armed Forces to efficiently assign teaching stations.[5] In these programs, the emphasis has been placed on courses for slow students, for gifted students, and for those who are employed part time.

Air Conditioning

Pressures for greater utilization of the plant have resulted in the installation of air conditioning systems in many schools. (See Chapter XIII for more on climate control.)

The possibilities of increased utilization in Gulf Coast areas through the construction of air conditioned spaces is tremendous. The school summer program can be expanded into a full program. Not only make-up work for failing students, but also extra, advanced study for rapid students, all types of remedial work, extensive recreational, and vocational programs. As most of these activities can be tuition supported, added cost to the taxpayer should be negligible.

Alton, Illinois, public schools get 20 per cent more use from their air conditioned spaces. The Alton summer school program has grown from 200 pupils before to 547 after air conditioning, and is still growing.[6] A large part of this enrollment (357) is in high school enrichment courses, and (190) in elementary remedial reading.

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[5] "Greater Utilization of the School Plant," School Planning, Vol. 5, No. 1, 1960, p. 7.

[6] "Facts About Air-Conditioned Schools," American School Board Journal, April, 1960, p. 62.

In planning for increased utilization, the administrator needs to keep in mind the following elements:

1. Educational adequacy.
   Will the educational program be improved?

2. Capital outlay costs.
   Original cost plus maintenance.

3. Maintenance and custodial costs.
   Less or more than formerly?

4. Traffic problems.
   More students, circulation problems.

5. Safety and sanitation.
   Increased student load, activities, may call for more attention to safety-sanitation problems.

Planning for Long-Range Utilization

The demands of the educational program upon the school plant are in a continual state of progress and change. New ideas and techniques are constantly being introduced into the educational picture--new concepts of class size, self-contained classrooms, team teaching, teaching machines, television, longer school terms, special classes for gifted and handicapped pupils, etc. In the face of the changes brought by contemporary educational experimentation, school plant management responsibility for long-range utilization planning presents a dilemma. What will they think of next?

Enrollments, of course, are the major factor in future utilization programming. Through studies of local population trends an administrator can estimate peak enrollments. If he will use these figures as emergency capacity, he may be able to avoid under-utilization at a future date.

Campus-type schools, plus better use of school transportation, are elements to be considered in planning future use of available facilities, as is the modern trend toward longer school days, weeks, and years.

One cannot anticipate very far in advance, but one can use, in building facilities, the kinds of spaces most readily adaptable to long-range use. These are large spaces, which can be adapted to various uses by means of movable partitions. Operable walls provide expansibility and flexibility of space, which can best be accomplished with large original spaces. It is next to impossible to achieve either with originally small spaces.

Community Use of School Plant Facilities

Since the schools belong to the public and the facilities are suited for many activities of a non-academic nature, school plant management is often called upon to make these facilities available for community use.

Obviously, a new building can be planned with public use in mind. An existing structure, however, very often is ill-equipped and inappropriate for use by lay groups. With this in mind, the following suggestions are listed for the benefit of the administrator who may want to know something of his responsibility in this area.

Zone heating: If the plant heating system does not lend itself to heating certain rooms and areas singly, without heating the whole building, in the Gulf Coastal area one might try economical electric heating units which are portable and may be plugged into any convenient outlet. Individually controlled gas space heaters provide for flexibility in heating.

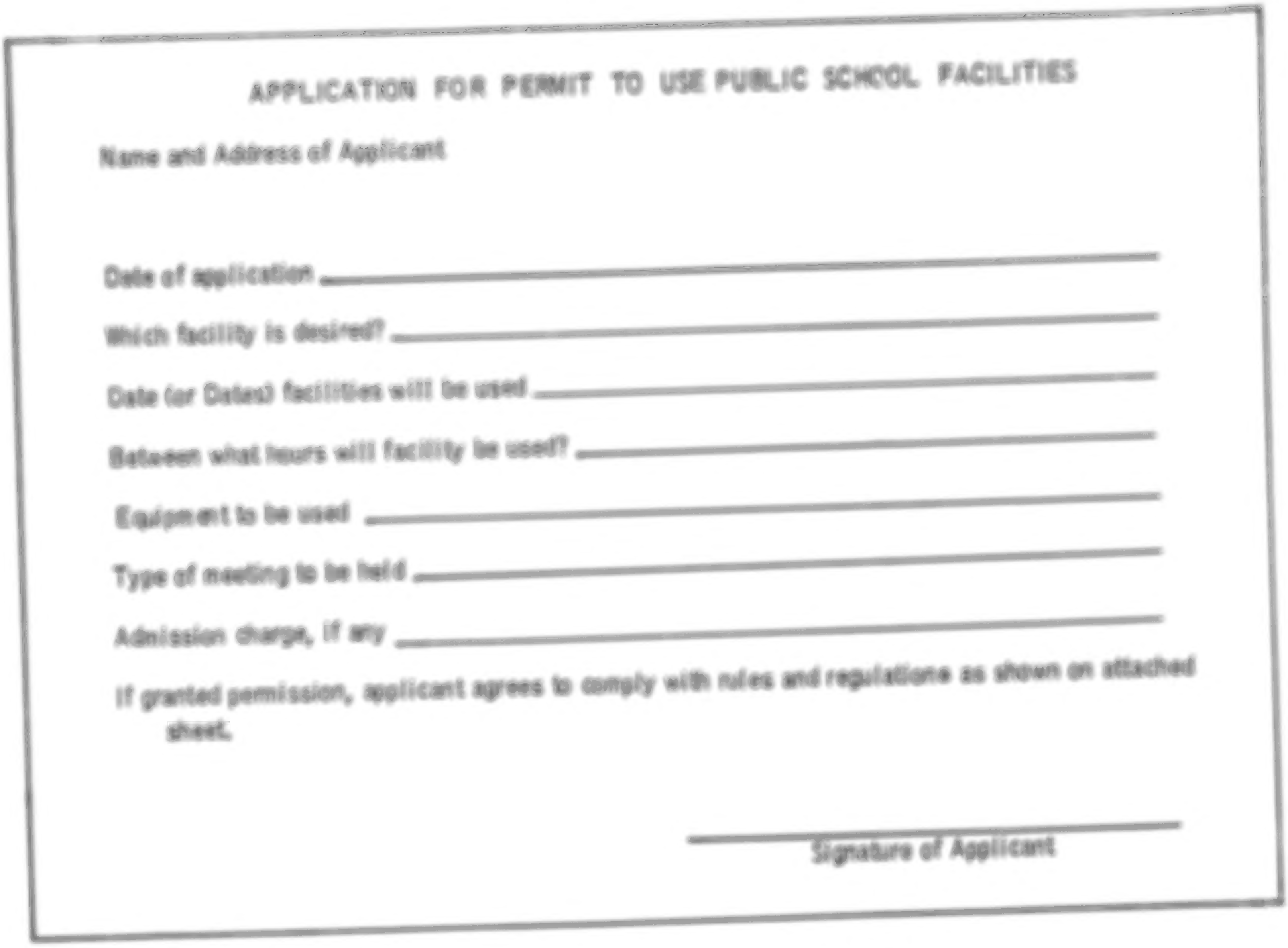
Entrances and exits: Ready access to areas used for community purposes obviates the necessity of locking rooms and supervising corridors. A suggested solution is folding steel cage-type closures at strategic locations.

Toilet facilities and drinking water: If such facilities are located near the areas which are used during off-school hours, traffic through unneeded portions of the building will be eliminated. Drinking water may be supplied via added appliances, and at small expense, but rest rooms may present a problem. Use of the steel gates (see above) may help here.

Light switches: These should be conveniently located so as to eliminate groping in the dark. A good suggestion is to leave a single night light burning at or near entrances to be used, which not only facilitates entrance but also discourages vandalism. A further idea is to use small, inexpensive shielded "night lights" which can be installed at the light switch.

Coat and hat storage: A classroom located near the public entrance may be converted into a check room through use of portable coat and hat racks; or for small groups, garments may be placed on desks and chairs. A table placed athwart the doorway will serve as a counter.

Telephone and first aid: A public telephone or telephones can be located for easy access to areas used by community groups. These should be recessed in the wall for space economy. First-aid supplies in a well-equipped but inexpensive portable kit should be readily available and clearly marked. A white kit with a red cross is customarily used.



APPLICATION FOR PERMIT TO USE PUBLIC SCHOOL FACILITIES

Name and Address of Applicant

Date of application ____________________

Which facility is desired? ____________________

Date (or Dates) facilities will be used ____________________

Between what hours will facility be used? ____________________

Equipment to be used ____________________

Type of meeting to be held ____________________

Admission charge, if any ____________________

If granted permission, applicant agrees to comply with rules and regulations as shown on attached sheet.

____
Signature of Applicant

Source: LaMarque Independent School District, La Marque, Texas

Illustrative Application for Permit to Use Public School Facilities

Figure 9.

Janitor-supervisor services: Some capable trustworthy person, preferably a school employee (custodian or teacher), should always be on hand during use of school facilities, especially to open the building and to secure it after its use.

Civil Defense and Disaster Needs

The Gulf Coast of Texas is a prime target area in the event of nuclear war, and is also subject at times to violent storms, as witness hurricanes "Audrey" and "Carla." Schools have been and will continue to be used as shelters in times of public disasters.

School administrators might well take into account the shelter possibilities of various building spaces, and from local civil defense authorities get an estimate of the number of people who might have to be accommodated in school facilities.

The following suggestions may be of help:

1. Participate actively with local civil defense groups.[7]

2. Survey school shelter possibilities.

3. Organize a plan of action for emergencies.

4. Collect a stockpile of water, food (U.S.D.A. canned food), first aid supplies, blankets, clothing, auxiliary generators, flashlights, portable battery radios, etc.

5. Have signs made, ready for posting, as to entrances, stairways, basement, etc.

6. Train teachers and students as to action and duties--and have periodic "trial runs." Your student council can act as monitors, teachers as wardens.

7. Educate for home shelters.

8. Publicize your plans.

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[7] A survey of the school plant and instructions may be obtained from government authorities.

Summary

To inventory the present plant capacity, to study alternate plans of immediate plant utilization, and to plan for long-range utilization, are the three major elements facing the administrator in programming for optimum utilization of the school plant.

In the capacity inventory, spaces may be classified as instructional, auxiliary, supporting, and utilitarian spaces. This assists in assigning usage values, both immediate, emergency, and long-range.

Capacity may be defined, in terms of utilization, as normal, emergency, and functional. Functional capacity is the more meaningful, as it refers to the value of a particular space in relation to the educational use made of it.

Two common measures of plant utilization are space utilization and pupil-station utilization. The latter is a truer index.

The major factor in estimating capacity and utilization is the planned educational program. Multiple use of space is one good answer to schools with a problem of crowding.

Air conditioning of school plants is resulting in much more advantageous utilization.

Modern ideas in education have created new problems in utilization. Some of these are new concepts of class size, team teaching, teaching machines, television, special classes, etc.

One cannot overlook, in planning for community use of the school plant, the possibility of its use as a public shelter in times of catastrophe.

Suggested Readings

Air Conditioning of Schools, Caudill, Rowlett and Scott, Architects, Houston, Texas. Furnishes in highly readable fashion the essential facts school people need to know about air conditioning.

Butler, George D., Recreation Areas: Their Design and Equipment, A. S. Barnes, New York, 1950. Covers the essential points to be considered in planning for maximum utilization of play areas.

Environment for Learning, Goleman and Rolfe, Architects, Houston, Texas. (Published by Carrier Corporation, Syracuse, N. Y., 1960). Relates utilization study to efficiency in air conditioned schools.

"Facts About Air-Conditioned Schools," *American School Board Journal*, April, 1960, p. 62. Reports the findings of recent studies of costs of air conditioned schools.

"Greater Utilization of the School Plant," *School Planning*, Volume 5, Number 1, 1960. Examines present usage in the light of future demands.

Guide for Planning School Plants, National Council on Schoolhouse Construction, Peabody College, Nashville, Tennessee, 1958. Provides a good yardstick for estimating utilization needs for school building planners.

Heeb, L. J., "How to Plan Your Schools for Community Use," *American School Board Journal*, February, 1960, p. 52. Considers the aspect of utilization of the school plant by the entire community.

"Portable Rooms for Crowded Schools," *School Management*, April, 1960, p. 90. Presents sound factual experience, valuable to school administrators with a problem of crowding.

"Should Your School Be Electrically Heated?" *School Management*, August, 1960. Presents case histories of costs versus efficiency in various schools in various geographical areas.

Strevell, W. H., and A. J. Burke, *Administration of the School Building Program*, McGraw-Hill Book Company, New York, 1959. Contains a fine chapter (8) dealing with the problem of utilization.

Texas Looks at Staff Utilization, Summer Conference Report, 1959, College of Education, The University of Texas, Austin. Reports a study of staff utilization made in summer seminar for secondary school principals.

Trump, J. Lloyd, *Images of the Future*, (pamphlet), National Association of Secondary School Principals, Commission on Utilization of Staff, 200 Gregory Hall, Urbana, Illinois, 1959. Presents an interesting projection of future secondary school needs with emphasis on staff utilization.

CHAPTER X

COMMUNITY RELATIONS

Although laws have influenced the patterns of public education, it is clear that no institution in a free society can long exist without public support. Effective school plant management demands a high order of ability in public relations. This chapter will consider several aspects of this important management function.

Parent-School Relations

Nietzschke and Marx to the contrary, good will among men is the basis for correct behavior. The school administrator who learns to practice this principle, with forebearance to those who do not respond in kind, possesses an important quality of educational statesmanship.

School Regulations Affecting the Home

It is important for good home-school relations to inform parents and to assist them to understand all school regulations which affect the routine of home life. Some of these areas are: age-of-admission policy, lunchroom schedule, traffic regulations, school bus schedules, private music lessons, dental appointments, after-school activities, attendance regulations, student insurance, procedure in case of accidents and emergencies, holidays, discipline, classification and promotion, grading system, courses of study, and character training.

A misadventure of any kind in any area can precipitate a vital crisis in home life and, improperly handled, can seriously disrupt school-community harmony.

Careful work with parent groups can bring about acceptance of reasonable, cooperatively produced policies relating to the items mentioned above, and firm interpretation of whatever rules are agreed upon are essential to the community relations program. Patient listening to parents' criticisms and complaints may often help a particular situation, and may also reveal things about the school, the staff, and teachers, of which the school official is not informed. Some key guide lines for school management in solving problems involving parents are patience, understanding, tolerance, negotiation, and compromise.

The Local Parent-Teacher Association

The local Parent-Teacher Association can be an excellent medium for developing an atmosphere of mutual understanding. This organization can be used to resolve many of the complaints of parents. The objectives of teachers can be explained to this interested group. The P.-T. A. usually is the largest and most continuous organization which attracts parents of school children to the school, its program and activities. It should be recognized as the most important potential force immediately available to the administrator. Properly promoted and used, it can "spread the good news" to many times its membership.

The P.-T. A. provides a natural medium for the explanation of the school program and its services. It provides opportunity for the exploration of new ideas. It is a reliable barometer of "consumer research" for effectiveness in educational procedures. Too, there is no economic or social barrier to membership. The opportunity to give personal service through P.-T. A. membership can be a constructive influence for good community morale.

Improving Relations with Parent Groups

The success of any parent organization as a positive community influence depends largely on good support from the school staff. Teachers and administrators should strive for close cooperation with parent groups and be alert to offer constructive suggestions for the activities of the organization.

Following are a few management techniques suggested for school officials interested in improving home-school relations:

1. The school executive should keep his office door open and should be easily accessible to visitors as much as he can. His telephone is an important public relations medium. It should be answered quickly and politely. In the official's absence, his whereabouts should be known by his secretary, and all calls, messages, and visitors courteously treated. The office should be a comfortable and friendly place to receive visitors. Waiting time for callers should be kept to a minimum.

2. The use of group action is a good device for improving morale and removing frustrations of people with common problems. School leaders who listen well learn to test public reaction through ideas expressed in conferences with parents and other school-related groups.

3. At times--not too often to become a burden to teachers--a proven community enlightener is the school exhibit, a 'dress-up' affair, either departmental or school-wide, where parents may see what their children are doing by examining samples of students' work. Also, inspection of new buildings, facilities, or equipment is often in order, not only during Public Schools Week, but as the occasion occurs. At these events, the public sees the school at its best, and can be more properly motivated toward helpful attitudes.

4. Parents like to come to school and go through a regular class schedule with their children. Evening or late afternoon affairs in which the typical class schedule is operated on short periods afford opportunity for parents to learn intimately just what their children do while at school.

5. Events where the school staff and parents can mingle in friendly social relationships are a very valuable administrative gateway to good community relations. These functions, such as teas, game parties, and the like, break down formal barriers, relieve tensions, and form a basis of constructive relationship.[1]

In most communities there are individuals whose special talents or vocational proficiency may be put to good use by the school. Classes, particularly homemaking, science, and social studies, can profit from the experience and technical know-how of various local persons who are generally pleased to be asked to contribute their talents. Such resources can be specially helpful for "career days," and for marriage-family seminars.

School-Community Relations

Persons who work in public life must understand criticism. School leaders should analyze criticism objectively, recognizing its contribution in the modification of conduct and the formulation of policy. If criticism is justified, it should be frankly admitted and corrective procedure put into motion. If criticism is unwarranted, it should be considered but not allowed to be a source of frustration. The best defense against unjustified criticism is a strong school system. A dignified, professional approach, informative reports to the board, factual accounts to the news media, carefully prepared speeches, are all proper and helpful means by which school plant management can inform the public about the true condition of the school system.

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[1] James L. Hymes, Jr., Effective Home-School Relations, (New York: Prentice-Hall, Inc., 1953), pp. 181-183.

Local "Politics"

Stearns admonishes school administrators to "avoid entanglement in local political action."[2] This warning signal has two precautions: first, the school plant administrator is an educator to the whole community, not just one faction. Second, if factions exist, he should play the role of impartial arbiter. The educational system has great power to influence public opinion in a free society. To allow this power to be used in partisan political action is to betray an obligation entrusted to professional school executives. The school leader must confine his relationships with political figures to school matters and avoid exchanging patronage for school support. The school administrator, adept in management skills, will not allow the school to become entangled in the rise and fall of political power and prestige. He will honor his public trust to administer the school plant in the interest of people of all creeds.

Service Clubs

The various clubs and organizations of a community afford excellent opportunity for the interpretation of the work of the schools. Clubs usually welcome good programs for the schools. Programs in which students are chief performers are usually popular. They reflect credit upon the school when well prepared and executed. Service clubs can also lend much to school activities through sponsorship of, or assistance in, various school projects. Caution should be taken that in ostensibly trying to help the school (with prizes, scholarships, etc.), clubs may seek selfish aims to the detriment of the school or students. These cases are rare among truly civic organizations.

Participation by school officials in community clubs pays dividends in good will. It affords him additional opportunities to interpret the schools to an important part of the public, and to gain important support for school plant projects which he considers vital to the operation of the school.

Professional Groups

Valuable assistance to the school program can be gained from professional organizations, lawyers, doctors, ministers, bankers, et al. These men usually are well-educated, lucid speakers, independent of social bias and genuinely interested in education.

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[2] Harry L. Stearns, Community Relations and the Public Schools, Prentice-Hall, Inc., New York, p. 43.

Astute plant management also dictates that craftsmen, contractors, trade unions, etc., be sought for the technical advice and help they can give to the improvement of the maintenance and operation programs.

Other Clubs

Other community organizations which, because of the type of personnel or the nature of their work, can make distinct contributions to the betterment of the school program are: the hospital auxiliary, Boy Scouts, Girl Scouts, city-county library, Women's study clubs, Y.M.C.A., Y.W.C.A., the Red Cross and Community Chest.

Schools and service organizations are allied agencies. They travel a two-way street. While they can assist the school program, the school can reciprocate by allowing community use of facilities, furnishing student programs and school staff speakers.

Participation of school personnel in community organizations, affords effective opportunity for schools to meet on common ground with the choice of community leadership and with all elements of community life.

School and Business Firms

Schools are well supported by business and industry. An important aspect of school plant management is involved when business and the school come into contact regarding the legitimacy of advertising through school activities.

When people assemble, it provides an opportunity for enterprising merchants to advertise their wares, and the public schools are no exception. Pencils, book covers, posters for athletic events, and calendars, with names of local merchants and products advertised thereon, are in common usage. Also popular are awards of various kinds offered by merchants, fashion shows, and contests. These are some of the devices by which business adapts the school situation to its advertising ends.

A strict "no advertising" rule has a tendency to divorce the schools from the business segment of the community and may tend to alienate the support of this important group if it is permitted to raise barriers to understanding of common purposes.

Students need to know about business competition, advertising, merchandising, et cetera, and there is evidence that, by careful planning based on mutual understanding, relationships with merchants may be developed in which the schools gain much benefit from practical examples of business dealings.

Some good guidelines to follow in this regard are: (1) students must not be exploited, (2) all merchants should be given equal opportunity, (3) common purposes should exist and be realized by both business and schools, and (4) good will should be enhanced, not damaged.

It is wise to have written general policies concerning relationships with business firms. Probably these should require that all advertising-promotional plans be submitted to a committee composed of merchants, teachers, parents, and students. Careful planning should avoid misunderstanding and resultant damage to school-community relations.

A delicate management problem may arise in a community where teachers are expected by some merchants to spend their salaries only at local business firms. This is a matter of principle. The local merchant has no right, because he "pays their salary," to demand anything other than the right to compete for teachers' business--by offering good merchandise, attractively displayed, and competitively priced. He is violating the principles of free economy under which he lives if he exerts any pressure on teachers to force their patronage.

School Executives and the Labor Movement

The school plant administrator must understand the role of labor in community life, especially as it affects the schools. He should see that the curriculum provides for the study of the "labor movement," the facts and related problems. He should work with the labor segment of the community objectively, endeavoring to enlist this potent force on the side of educational betterment of the community and the technical improvement of his plant management programs.

Following are suggestions to school administrators for dealing with people involved in labor:[3]

1. Acquire an understanding of the "labor movement" and its role in the industrial structure of the United States.

2. Analyze the type and extent of the labor organization in the community. Estimate objectively the force and direction of this organization applied to school problems.

3. Realize that labor has a natural affinity for public education and will support it if it is not alienated.

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[3] Harry L. Stearns, *op. cit.*, p. 205.

4. Understand the controversial school-labor areas: board attitude toward employment of union labor, treatment of labor in the curriculum, attitude of trustees and teachers toward unionization of teachers, interference with teachers' freedom to teach.

5. Consult with labor leaders and management on job training courses school may provide.

6. Consult labor leaders in planning such school events as education-industry days.

7. Cultivate a personal rapport with labor leaders, non-partisan and non-political, but pro-educational.

8. Encourage labor representation on lay committees and boards of education, but avoid partisan action on matters affecting all children.

9. Maintain a position of objective neutrality in all professional dealing with labor controversy.

The chief role of the school administrator is not to be a partisan advocate for or against any segment of community life, but is to deal objectively with all such segments, to the end that the composite resolution of all community forces may be directed toward the best attainable service for youth.

Religion and the Schools

The church and the school are partners in education, the kind which brings academic, social, and moral betterment to the community. The home, the church, and the school have been the essential elements in the growth and promulgation of our way of life. There is ample ground for teamwork and grave necessity for cooperation.

Following are several suggestions which may help the school executive attain rapport with the various religious faiths in his community:

1. Study the composition, the personnel, and the tenets of the various religious elements in the community to understand and respect them.

2. Establish good will between the school administration and the various clergymen of the town.

3. Cultivate the belief that religious education is an essential segment in the heritage of each child, and that schools should do all they can to facilitate the work of the churches in fulfilling this obligation to youth.

4. When special seasons or programs call for invocations, sermons, or devotionals, use all representative clergymen in rotation.

News Media

In the school's relations with news media, the unfailing guide should be a knowledge of news requirements and a sense of proportion regarding human feelings and the over-all school welfare.

Frequently, events which have a high news value are harmful and embarrassing to people who are involved. A reasonable approach is to see that news is given out, if possible, by the official school sources, as soon as the facts are known. This may prevent the distortion of important stories by community "grapevine." Any responsible reporter or editor will respond to reason, straightforwardly presented, and in most cases will protect, rather than embarrass principals in news stories.

The important factor in news reporting is time. Astute school management takes care to orient the school staff to the importance of what constitutes news and when it should be released. Newspaper editors and radio and television announcers can be a powerful influence for good public relations.

Maintenance of the school plant is an acceptable subject for news articles. The public likes to know what the school board is doing with the physical plant and property. This public information increases the esteem in which the school is held.

People learn about schools through what they see, what they hear, what they experience, and what they read. So the visual, auditory, and psychological processes grow into understanding and the ultimate formation of judgment.

Developing a "Sense" for Community Relations

One of the most important and exacting duties of a school administrator is the interpretation of the schools to the public. A talent for estimating public opinion is composed largely of the ability to assemble and face facts, to interpret data objectively. The school administrator should have a knowledge of the general rules of individual and group reaction, the aims and objectives of public education, an alertness to all things that happen in a community, and a perspective which places each fact, opinion, and event in its proper relationship to the total school-community picture.

Summary

Good will is the basis for satisfactory community relationships. It is the first, and a most essential step, in the solution of school-community problems. This means respect for all human personality and the practice of good human relations.

Good parents are interested in their children. The first allegiance of the parent embodies what he thinks is best for his child. Upon this common objective, teachers and administrators can join with parents to form the basis for good school-community relations--to improve the school program and make parents a part of that improvement.

Listening to conversation, reading editorials, news items, and letters, receiving telephone calls at home and in the office, guiding the schools through budget procedures and building programs, attending board meetings, studying the personalities and talents of board members, presenting and defending constructive programs for school improvements, dealing with teacher groups, interviewing job applicants, sharing experiences with children--all these are among the rich experiences which accrue to the school administrator as he travels his professional road, which enable him to sharpen his talent for estimating what the people want their schools to be. The news media will reflect this understanding of the school program and can be a means of informing the public about school plant maintenance, management, etc.

Suggested Readings

Bottrell, Harold R., Using Community Resources Within the Curriculum, College of Education, University of Houston, Texas. Explains the what, why, how, and when of using community resources, giving criteria for selecting and appraising their usability for teaching and learning.

Campbell, Roald F., and John A. Ramseyer, The Dynamics of School-Community Relationships, Allyn and Bacon, New York, 1955. Considers the changes in the American community and describes the important relationship between the citizen and formulation of school policy.

Committee on Education and Religion, The Function of the Public Schools in Dealing with Religion, American Council on Education, Washington, D. C., 1953. Contains basic information designed to help the school leader understand the problems regarding religion as it affects schools.

Education, an Investment in People, Washington, D. C., United States Chamber of Commerce, 1954. Shows that education, business prosperity, and economic competence go hand in hand.

Hymes, James L., Jr., *Effective Home-School Relations*, Prentice-Hall, Inc., New York, 1953. Suggests many helpful devices for carrying out constructive parent-school programs.

Images of the Future, Educational Research Service, 1201 16th Street, Washington, D. C. A Ford Foundation study dealing with future of secondary education; a brief treatment of several aspects of education, with a fine commentary on community relations.

Johnson, Ernest F., *American Education and Religion*, Harper and Brothers, New York, 1952. Presents a series of addresses by leading representatives of the major faiths. Helpful to the schoolman who needs authoritative statements by leaders of the faiths represented in his community.

Pierce, Truman M., E. C. Merrill, Jr., Craig Wilson and R. B. Kimbrough, *Community Leadership for Public Education*, Prentice-Hall, Inc., New York, 1955. Defines the role of the school administrator in school-community relations.

Starr, Mark, *Labor Looks at Education*, Harvard University Press, Cambridge, Mass., 1946. A recognized labor leader presents an excellent statement of the position of organized labor toward the public schools.

Stearns, Harry L., *Community Relations and the Public Schools*, Prentice-Hall, Inc., Engelwood Cliffs, New Jersey, 1955. Treats extensively all facets of school-community relations. Comprehensively indexed.

CHAPTER XI

TRAFFIC CONTROL

The educational program of a school is enhanced by calm, purposeful, and orderly movement of pedestrian and vehicular traffic on and near the school campus. The control of this traffic is a major responsibility of school plant management. A comprehensive program of traffic control serves to stabilize necessary pupil movement, directs youthful energy into dignified channels of response, trains students for safe living, and promotes community cooperation and good will.

This chapter will offer some practical considerations for the management of a school traffic program.

Pedestrian Traffic

Movement of the student population in buildings and on the school grounds creates the need for pedestrian traffic control.

Outdoor Pedestrian Traffic--Off Campus

The school cannot very well exercise control over the pedestrian child all the way to and from school, but a program of community-school-police cooperation will ensure an optimum margin of safety for walking pupils. In this co-operative program are included:

1. Placing appropriate traffic signs on access streets.

2. Installing signal lights at important school crossings.

3. Promoting an educational program for parents (letters, newspaper, radio, television).

4. Stationing local police at school crossings.

5. Training a school safety patrol.

6. Encouraging parents or older children to accompany young walkers to and from school.

7. Devising campus regulations for pedestrians.

8. Teaching pedestrian safety at school.

A point worth emphasizing is that parents need to walk with the child to and from school at least once, preferably the first day of school, and ascertain the nearest, safest way to and from the campus and home, calling particular attention to crossings, intersections, and other traffic hazards along the way.

In large cities, the school might furnish parents of walking children with a map showing the nearest, safest routes, and marking critical intersections and crossings. This is important for beginning pupils and new arrivals.

The school administration, in meetings with local traffic control authorities, can point out the need for traffic signs and signals at all important and hazardous places along access routes used by pupils, both vehicular and pedestrian.

Of great significance in pedestrian traffic control is publicity. The school authorities, by a comprehensive program of publicity--by letter, newspaper articles, radio and television announcements--can let parents know at what time school begins and closes, and of special times which depart from the established routine.

Local police can be of invaluable assistance to the morning and afternoon traffic congestion. They lend authority and dignity to the school safety patrols (if used). These officers might be remembered by the school administration at appropriate intervals, by public thanks and citations.

Parents might also borrow a tactic from the well-known "car pool" by organizing neighborhood or block "pedestrian pools," with a parent or older high school child accompanying the small fry to and from the school campus.

Outdoor Pedestrian Traffic--On Campus

Each building and outdoor circulation area has its own particular aspect of pedestrian traffic. The building principal may want to survey the flow of pupil foot-traffic in relation to automobile and bicycle traffic and parking areas, cafeteria traffic, bus loading and unloading, playground apparatus and movement, and traffic by other

PEDESTRIAN TRAFFIC SURVEY

School ____________________

Area	Hour	Traffic Flow*	Remarks
Front entry	8:00 a.m.	Heavy	More dispersal
East side	8:00 a.m.	Heavy	Narrow street, walks
South bus	8:10 a.m.	Normal	Bus blockage (signs)
West parking	8:10 a.m.	Normal	Better arrangement
Junior Playground	9:50 a.m.	Light	Revise schedule?
Cafeteria	11:30 a.m.	Normal	
Cafeteria	12:05 p.m.	Heavy	Stagger schedule?
West gymnasium	2:35 p.m.	Heavy	Reroute high school students

*Heavy, Normal, Light

By____________________

____
Title

Illustrative Pedestrian Traffic Survey
Figure 10.

people from adjacent school areas. After such a study, regulations can be devised to effect an orderly flow of traffic.

CHECKLIST OF CAMPUS PEDESTRIAN REGULATIONS

* Automobile riders will please disembark at curb, on curb side only.
* Students will please not congregate at unloading areas.
* High school students will use north walk only, to and from gymnasium.
* High school students will use only east entrance to cafeteria.
* Vocational shop students will use south entry to and from shop classes.
* Students in rooms 201 to 215 inclusive, will use west stairs, except during fire or emergency drills.
* Students in rooms 112 to 121 inclusive, will use rest rooms in east wing.
* Tenth grade students will go to homeroom immediately upon arriving at school. Homerooms will be open at 8:00 a.m.
* Eleventh and 12th grade students may go to first period classes as early as 8:10 a.m.
* The school library will be open to early arrivals at 7:30 a.m.

A suggested device for minimizing pedestrian traffic congestion outside buildings is to stagger time schedules for classes, recess periods, lunchroom hours, and school closing. A five-minute disparity between release of elementary school and high school pupils will allow parents to pick up youngsters, enable the smaller children to board buses more safely, and permit the tiny tots to make their way across dangerous intersections before older children are released.

CHECKLIST OF RULES FOR PEDESTRIANS

- Stay on the sidewalk when walking.
- Walk facing traffic when there is no sidewalk.
- Cross streets only at corners.
- Look, be sure the way is clear, BEFORE crossing.
- WALK, do not run, straight across street.
- Walk without loitering.
- Know what traffic signals mean, and OBEY them.
- Obey Your Safety Patrol.
- Do NOT accept rides from strangers.
- Avoid pushing and tripping.
- WALK, do not run, in school corridors and on stairs.
- Know the safest way to school and to home.
- Respect others while playing.
- Be alert at all times.

Indoor Traffic

Student circulation within school buildings involves the movement of large groups of people from place to place within a brief space of time. "A well-ordered, efficiently controlled corridor tends to build a higher level of classroom attainment."[1]

A school building with wide, well-lighted corridors, recessed lockers, wide stairways with large landings at the midpoint, and classrooms equipped with double exit-entrance doors, has been planned and built for smooth flow of pupil traffic. The administrator who must plan his student movement in buildings not so well arranged faces a larger problem.

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[1] John C. Wright, "Order in the Corridor," Clearing House, March, 1958, p. 422.

The school population can be trained in the proper techniques of between-class circulation. Some suggestions as to how this may be accomplished are:

1. A list showing desirable building traffic conduct in hands of each student on opening day of school. The Student Handbook may include items such as:

    a) Move on right side of corridor.

    b) Avoid skipping stairs.

    c) Walk. Running may result in injury to self or others.

    d) Talk in normal tones. Talk while moving.

    e) Be especially careful in locker areas.

    f) Avoid crowding at classroom doors and stairways.

2. Student Council participation

    a) Conduct assembly programs.

    b) Make announcements over public address system.

    c) Act as corridor monitors.

    d) Make signs and posters.

    e) Devise a code of conduct for students.

3. Student traffic squad

    a) Choose for appearance, posture, alertness, courtesy, high scholarship.

    b) Brief student body on traffic system before squad assumes duties. Cooperation asked.

    c) Apprise students and squad of undesirable conditions.

    d) Secure adult supervisor for squad.

    e) Hold regular meetings.

f) Assign duty stations, post duty rosters, and change shifts regularly.

g) Admonish violators, never touch them, no "arrests." Repeat violators reported to supervisor-sponsor.

h) Enforce regulations devised by Student Council, approved by administration.

i) Assign junior high students to duty only in junior high building.

Traffic control in school buildings centers primarily around the problem of preventing congestion in areas of heaviest circulation. Some of these areas are:

Corridors
Stairways
Lobbies, Foyers
Entrances, Exits
Locker areas
Library
Classrooms
Cafeteria
Gymnasium
Auditorium

The problem is complicated by narrow corridors and stairways, inadequate width and number of entrances, small spaces for lobbies, etc. Weather is an additional factor, at times forcing traffic indoors when it normally moves outdoors, congesting traffic flow.

A practical answer to a narrow corridor problem consists of two facets: first, an educational program such as outlined earlier, and second, an adjusted time schedule, permitting some sections of students to move a minute or so earlier than other student segments. An individual room buzzer here may be more conducive to order than the traditional bell. Teachers can also synchronize watches and move quietly by a prearranged plan, using no signals.

Interchanges between classes load the corridors with lively, young humanity several times daily. With each such shift a student travels from sixty feet to a nearby classroom, up to a thousand feet to another building, assuming always that the trips are made in the same amount of time. It also occurs that a student is assigned to two or more successive classes in the same room.

This distance-time factor is an important aspect of building traffic-control, one which leads the school administrator to ponder several points which may lead to a solution of the problem:

1. Place classes in locations which make for more rapid exit for students who have to make long trips to reach other buildings.

2. Allow more time for movement to outlying buildings, such as shops and gymnasiums. Classes in these spaces start later, release earlier, to coincide with academic schedule.

3. Schedule building sections instead of subject sections. Required work, such as English, social studies, and mathematics, have the larger enrollments, and can be segregated, and interspersed with smaller classes, to balance the traffic flow in corridors.

4. Check a few individual student schedules, several from each grade level, and get an idea of typical student movement. This will give a clue as to practical arrangement of class placement.

If the school budget can afford it, covered walks between buildings, canopies for entrances, and covered bus loading stations are a distinct asset to school administrators plagued by traffic problems complicated by inclement weather. Inexpensive protection of this type can be built of used pipe (as small as 2 inch) uprights, set in concrete, 2 x 6 purlins, and ship-lap decking, covered with corrugated or V-type galvanized iron.

Pedestrian Traffic on School Grounds

On the school grounds, pedestrian traffic control entails not so much the prevention of congestion as it does the direction of movement.

Most school campuses have areas of lawn, shrubbery, and other landscaping features which can suffer considerable damage from student strollers. Walks may be provided but often disregarded as students follow the paths of others taking "short cuts."

A practical approach to the above problem is to build walks where the students want them. Economical construction of walks is possible by use of oyster shell, common surfacing material on the Gulf Coast. Gravel and black-topping of the shell also make economical surfaces for connecting random walkways. These walks are at ground level, and do not interfere with mowing machines.

A thoughtful plan of encouraging student pride in the beauty and neatness of their campus is another way to prevent careless disfiguring of the school grounds by haphazard pedestrians. Part of such a plan might include student council participation, student "Clean Up" days, "Beautify Our Campus" programs, and gifts of trees, shrubs, benches, etc., by classes, student clubs, Boy Scouts, Girl Scouts, and other school or school-related organizations.

Morning arrivals at school, the noon hours, and school closing period in the afternoon, create the largest traffic problems. A practical approach to the rush hours of pedestrian traffic is suggested here:

1. Secure as long and wide an area on the street as possible to facilitate entry and exit from cars.

2. Separate widely, if possible, the bus loading-unloading area from street traffic.

3. Widen sidewalks along main concourses used by students.

4. Separate, if possible, student parking areas from main traffic streets.

5. Employ student traffic squad, local police, duty teachers, etc., where necessary, to keep traffic moving safely.

6. Publicize problem among students; ask for cooperation in reasonable solutions.

7. Publicize problem to parents, asking their cooperation in observing reasonable regulations.

8. Stagger lunch hour schedule to relieve crowded cafeteria lines.

Fire and Disaster Drills

An important item in pedestrian traffic control in schools is in fire and disaster drills. Each school has its own peculiar problems in this respect, and each building supervisor needs to make his own survey of possible exits, normal and emergency, and conduct practice drills to ascertain the most rapid and safe means of moving all occupants from the building.

Fire and disaster drills are good training maneuvers and morale builders for the student body. Well-organized, regularly held, and timed, they can serve to train students in orderly mass movement, and teach them habits of safety and courtesy. These values tend to transfer into the daily routine of building traffic. Safety is always the criterion--not rushing or panic.

Vehicle Traffic

Wheeled traffic control on and near the school campus involves automobiles and bicycles. In the automotive area, four categories exist: student driver, parent drivers who drive children to and from school, service vehicles, including school buses, and casual traffic.

Automotive Traffic; Student

"School administrators are generally aware and perturbed by the increasing number of youths driving to school, and the attendant parking problem. They realize also that the problem is only beginning. If one allows 150 cars per acre (on a 50 per cent per enrollment basis) a high school of 1800 capacity, allowing space for 50 per cent of the student body, would need from six to seven acres for parking alone!"[2]

New school plants can be planned to allow for necessary student and staff parking, but how can the administrator with an old, and inadequate site, find enough room for parking spaces?

Some suggested solutions are:[3]

1. Acquire adjacent land.
2. Build underground and/or multi-storied parking, if in a crowded city location or land values are excessive.
3. Use school buses, or city vehicles, to transport local students.
4. Use parking permits based on need -- distance from school, number of riders, etc.

> For grammar and junior high schools, the primary consideration in terms of parking should be for the faculty, staff, and visitors. Considerable planning is essential to enable parents to leave and pick up children without blocking the normal flow of traffic. In high school planning, consideration should be given to the provision of parking space for about twenty per cent of the students and for all of the staff and faculty.... Studies should be made relative to night-

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[2] John S. Peters, "Parking and the School Site," American School Board Journal, January, 1958, p. 17.

[3] Ibid., p. 18.

> time auditorium usages. It is seldom within general economic limits to provide for extreme peak conditions.... one space for every eight seats would be sufficient for a school auditorium.[4]

Parking is only one problem with student drivers calling for school administrative control. The movement of the vehicles is in many cases a larger problem, calling for cooperation with community groups and local traffic authorities.

The school administration needs to have a well-defined program and procedure for student vehicular traffic control, originating in school board policy, buttressed by legal authority, approved by the community, and accepted and observed by the student drivers. Such a program is much better received and observed if the students have a part in its formulation and are given some responsibility for their own regulation and safety.

A School Student Traffic Plan

A comprehensive traffic plan for students may include the following items:

1. Set forth the general purposes and aims of the program in the school board policies.
2. Implement the plan by meeting with student drivers.
3. Encourage student council, or committee of student drivers, to devise own "code," approved by administration.
4. Publicize program to enlist support of students, teachers, and parents.
5. Invite local traffic authorities to act as consultants.
6. Organize student traffic squads, or safety patrols, if needed.
7. Ask local civic authority to grant needed sanctions or warrants where student traffic overlaps into city traffic.

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[4] Access and Parking for Institutions, The Eno Foundation for Highway Traffic Control, Saugatuck, Connecticut, 1960, p. 24.

CHECKLIST FOR STUDENT TRAFFIC SURVEYS

1. Distance from School

Grade	Under 1/2 Mile	1/4-1/2 Mile	1/2-1 Mile	1 - 2 Miles	2 - 3 Miles	3 - 4 Miles	4 - 5 Miles	Over 5 Miles
Totals								

Source: Jon S. Peters, "Parking and the School Site," American School Board Journal, January, 1958, pp. 17-18.

8. Provide some manner of restrictions for violators. This may include "grounding," temporary loss of permit, enforced practice of driving courtesy, etc.

9. Organize student traffic court.

10. Teach traffic safety and courtesy outside of driver education classes. (By slogans, signs on placards, "safe driving" week, etc.)

11. Provide adequate police protection for the traffic load.

CHECKLIST OF MEANS OF GETTING TO SCHOOL

Grade	Walk	Car: Parked	Car: Not Parked	School Bus
Totals				

Senn High School, in Chicago, has an annual "Safe Driving Day" program, the gist of which is quoted below:[5]

> Safety posters and slogans are placed in various conspicuous spots in buildings and on grounds.
>
> Traffic signs are put up to familiarize students with shapes and messages.

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[5] "Safe Driving Day," Industrial Arts and Vocational Education, April, 1959, pp. 119-121.

Slogans are worn on paper hatbands, placed on automobile bumpers, on bulletin boards.

Pictures of wrecks, with appropriate captions (borrowed from state or local highway departments) are placed in convenient locations.

Wrecked car can be put on campus, with appropriate warning messages.

Publicity in school and local papers and radio.

Recognition for student contributions to safety.

Assembly programs.

Safety slogan contest. Sample slogans:

You may have nerve -
But don't pass on curve!

Drive slow, not fast,
Or you'll be in the past!

Don't be a heel
Behind the wheel!

If while driving you're alert,
You'll go thru '61 unhurt.

For schools wishing to use the above idea, more emphasis can be given by using films, one of which is available from Walt Disney Studios, Hollywood, California, entitled "Motor Mania." (Free rental.) Also useful are thousands of free pamphlets from the Allstate Insurance Company (any Sears, Roebuck store). Some of these titles are:

"Hi, Bike Pilots"

"How Fast Can You Stop?"

"Mental Menace"

"Defensive Driving Tactics"

"Night's Deceiving Eyes"

"Killer Horses"

CHECKLIST OF CAR POOL DATA

Number of Riders	Number Per Car	Parking Spaces Needed
	1	
	2	
	3	
	4	
	5	
	6	
	Totals	

Automotive Traffic; Street

The fact that large numbers of children arrive at school in cars, at approximately the same hour, creates a problem for some schools.

The application of traffic warrants is suggested for school administrators seeking solutions to congested and unsafe traffic conditions. Traffic "warrants" is a technical term used by traffic safety engineers to denote criteria developed by engineers for the use (or non-use) of signs, signals, and markings. These warrants are justifications coupled with observation and informational studies of street locations, which determine what engineering sciences should be applied at a particular location.

School authorities can get these warrants applied to a local situation by requesting the Texas State Department of Public Safety to conduct a traffic engineering survey. This, coupled with the cooperation of the local municipal or county police departments, will result in an evaluation of the problem and suggest a plan of attack.

By use of warrants (which form a basis for obtaining legal authority) the school may have curbs painted, signs posted, areas restricted for buses, cross-walk lines painted, signal lights installed, etc. All or part of this cost may be borne by the school district. An agreement may be reached with municipal officials on the amount of city or county responsibility.

If streets are wide enough to permit their use, "islands" in the center of streets are a fine safety feature for school crossings. This is a raised section between traffic lanes, as least six inches high, four feet wide, and thirty feet long, tapering at extreme ends, which channel traffic to either side and permits a zone of safety for pedestrians, as well as aiding officers in controlling traffic movement.

A recent study by Illinois highway engineers reveals that traffic "islands" reduce accident rates as much as 26 per cent at crossings where they have been installed.[6]

Publicity is a great weapon in traffic control. Letting the people concerned know what the problem is, and asking their cooperation in the solution, is a move strongly recommended.

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[6] "Life Saving Islands," Traffic Digest and Review, July, 1960, p. 5.

School Safety Patrols

To be an asset, safety patrols need to be well-organized, chosen with care from the most able students, dressed smartly, and never given authority over anyone older than they. They are best used on the school campus proper. They may be used to help local police in traffic work, but should work only with student foot traffic, and should never direct traffic in the street.[7]

School Parking

If at all possible, assigned and marked faculty parking spaces are an asset to the school traffic program. Student areas can also be assigned, perhaps by groups, as convenient as possible to given building areas. Provision also must be made for visitor parking.

Street parking is more difficult to control than campus parking. Here one needs authorization from city officials. A city ordinance will spell out the line between city and school authority.

The school administrator might do well to investigate the possibility of asking the city to move curbs into school property eight or ten feet, to permit angle parking and also to permit closer supervision by school authorities. The cost of the work can be shared by the city or county and the school district.

Automotive Traffic; Service Vehicles

There are a number of vehicles serving school needs which are to be provided for in school traffic planning. In addition to school buses, there are delivery trucks (to cafeteria, shops, offices, gymnasium, auditorium, etc.), and occasionally, ambulances and fire apparatus.

On a campus which has not been designed for service vehicles, the following suggestions may be helpful:

1. Shelled or graveled one-way lanes, clearly marked or cabled off, leading from access street, with turn-around at unloading site.

2. Clearly marked ramps at curbside for entry.

3. No service road to cut across playground.

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[7] J. D. Engman (ed.), A Survey of Selected Gulf Coast Schools, 1961.

4. All service entries at rear of buildings and campus, if possible.

5. Service restricted to low-traffic house, if possible.

6. Request service people to notify receiving party before delivery.

7. School bus loading-unloading area removed from main traffic area, if possible. If not, curbs painted and clearly marked, "For Buses Only."

8. No other vehicular traffic allowed in school bus area at loading and unloading times.

9. Adult supervision at bus area at all times.

10. Buses numbered and stategically parked to better serve riders, and for maximum safety.

11. Police officers to supervise entry and exit of school buses.

12. Publicize all traffic regulations to student body and to public, especially by letter to all school bus parents.

13. Shortest possible line of access from the highway.

14. Loading platform away from pupil traffic.

Bicycle Traffic

Under state traffic regulations, bicycles are treated much the same as automobiles.[8] Popular as the "bike" is among children, it does not meet with the same approval among adults, for motorists do not appreciate bicycles on the streets, and pedestrians prefer that bicycles do not travel on sidewalks.

Bicycles, then, become a special and unique traffic problem. Young cyclists need special facilities and regulations. These can be provided by the school administration, with the cooperation of the municipal police department, the parents of bicycle riders, and of the cyclists themselves.

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[8] A Community Bicycle Safety Program, (New York 38, New York: Association of Casualty and Surety Companies, 60 John Street, 1956), p. 4.

The school can meet its obligation in this regard by:

1. Providing ample parking spaces for bicycles; covered rack areas, if possible, away from other traffic areas.
2. Designating "bike ways" where needed on the campus.
3. Providing ramps for bicycles at curbs where needed.
4. Having cyclists dismount and walk bicycles across busy school intersections.
5. Requiring cyclists to walk bicycles on campus where bikeways are not provided.
6. Registering bicycles with building principal, to prevent thefts, to regulate parking, and to ascertain violators.
7. Establishing procedures to deal with violators.
8. Organizing bicycle club, bike safety patrol, etc.
9. Issuing bicycle permits based on age, grade, distance from home, etc.
10. Teaching bicycle safety in school. (See Checklist)

The municipal regulations should provide for:

1. Inspecting bicycles for safety.
2. Testing bicycle owners for riding ability and knowledge of traffic.
3. Registering and licensing bicycles.
4. Reporting and dealing with ordinance violations.
5. Furnishing information on accidents and causes.
6. Furnishing speakers and consultants for safety programs.

Responsibility of parents (community) lies in the area of cooperation with school and municipal authorities in teaching children respect for regulations. Parents of bicycle riders might also see that their children's bicycles are properly cared for, make sure their young cyclists are adept at handling their vehicles, and that they may be properly tested and licensed.

Some schools find it convenient to hold at intervals, on a Saturday morning for instance, a testing-licensing day in cooperation with the local police department. A street block adjacent to or on the school campus can be blocked off temporarily for the purpose.

CHECKLIST OF RULES FOR BICYCLES

* Practice in a safe place, away from traffic.

* Ride a bicycle the right size for you.

* Keep the seat and handlebars adjusted to your comfort and safety.

* Boys, wear trouser clips.

* Ride single file on busy streets, and not more than double file on any street.

* Look left, then right, before crossing intersections.

* Walk your bicycle across busy intersections.

* Learn and use hand and arm signals in traffic.

* Dismount and walk your bicycle to your parking space when you reach the school grounds.

* Keep your tires clean and wheel bearings greased.

* Put your bicycle away when not in use.

Adapted from "Start the Young," Safety Education, March, 1959, pp. 25-30.

On the day assigned, unlicensed cyclists gather at the school and go through their paces for the traffic authorities. They must successfully pass through four stations to qualify for a license. These stations are:

Station 1 - Safety inspection of bicycles.

Station 2 - Testing bicycle owners for knowledge of traffic rules.

Station 3 - Testing for riding skills.

Station 4 - Registration and issuance of license tags.

For a detailed description of these stations, sample tests, diagrams, and sample registration cards and licenses, write for the pamphlet, "A Community Bicycle Safety Program," sent free of charge by the Association of Casualty and Surety Companies, 60 John Street, New York 38, New York.

CHECKLIST OF RULES FOR ROLLER SKATES

- Fasten skates securely to shoes.
- Take off skates and walk across streets.
- Take off skates in houses and buildings.
- Never carry heavy, hard, or sharp objects while skating.
- Never skate in the street.
- Skate only on surfaces meant for skating.
- Keep skate wheels clean and bearings oiled.
- Put skates away when not in use.

Adapted from "Start the Young," Safety Education, March, 1959, pp. 25-30.

Legal Aspects

Before any program of traffic control is activated, the school administration needs to have authorization provided by legislation. It also needs the protection afforded by local and state governments, and by its own written board policies.

Under the law, a public school is a governmental unit, and as such, can legislate, through its board of trustees, proper authority for needed controls within the defined limits of the school campus. Such controls cannot, of course, supersede or interfere with local or state regulatory authority.

Responsibility

It falls upon the school authorities to initiate the cooperative movement which results in a sound program of traffic management.

It also becomes the responsibility of the school to formulate policies on handling of accidents and violations on the campus, for furnishing information and keeping records.

Planning

Community groups might well be involved in planning the program of traffic control, for upon them, the people, rests the responsibility for the success of the program. It is the general public who must approve, in order to accept and abide by the regulations decided upon as necessary. A cooperative planning group should include representatives of school, city management, police, state highway department, parents, students, civic and business organizations, and public information media. This group may assist the school administration by:

1. Serving as a fact-finding committee.
2. Helping to devise standards.
3. Enlisting public support.
4. Finding ways and means to finance probable costs.
5. Evaluating results.
6. Recommending improvements.

Legal Authority

The school board policies should set forth the general principles upon which the program is based. The administration translates these policies into regulations for staff and students, outlining rules in the student handbook and in the teacher bulletin.

The planning committee decides on a course of action guided by warrants designed by traffic experts. These ideas and warrants form the bases for requests for ordinances passed by the municipal government. These ordinances out-line the duties and responsibilities of the city traffic officers relating to school traffic situations.

Emergency, or temporary authority can be effected by executive order of a mayor, city manager or county commissioners. This can be used to activate a program which may otherwise need to wait until permanent legislation can be drafted.

Special Deputies

The school can, by official board petition, get school staff members deputized by the local police department to assist in traffic control. This adds legal status to school employees, and may greatly assist an understaffed police force in handling school traffic.

In some large cities police departments are employing women in part-time duty as school crossing guards. These women are assigned posts near their homes and work short stints during the morning and afternoon. They are carefully chosen, are given adequate training for the job, wear uniforms, and are backed by full police authority.[9]

Summary

One aspect of school plant management responsibility involves the control of student movement on the campus, both vehicular and pedestrian.

A traffic control program includes street signs, signals and markings, the use of local police officers, an educational program for parents and for students, and regulations designed to facilitate smooth and safe movement of traffic inside and outside school buildings.

For walking pupils, an educational-informational program for parents is advised. "Pedestrian pools" are suggested for protection and direction of young walkers.

Student traffic inside buildings involves the movement of large groups of students rapidly, quietly, and safely. Suggested devices for relieving congested corridors, stairs, and entrances are to stagger hours for classes, recess periods, lunchroom, and school closing. Proposed also is the idea of using fire and disaster drill techniques in training students in proper order of building movement. "Traffic squads" might be introduced to advantage here.

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[9] B. L. Corbett, "Safeguarding School Crossings," Traffic Quarterly, July, 1952, p. 372.

The areas of heaviest circulation need to be studied in order to effect solutions for problems of crowding.

Covered walks, entries, and bus loading stations are suggested as partial remedies for crowded conditions brought about by inclement weather.

Student participation in traffic control and safety is urged, particularly in regard to automobiles. A student "safety day" is recommended.

Student parking is an increasing problem for school and city authorities. Suggestions offered for partial solution include acquisition of adjacent land, building multi-storied parking garages, use of school buses to transport local students, and issuance of parking permits based on priority of need.

Traffic warrants are a device for solutions to street traffic problems. These can be applied by asking the cooperation of state highway department engineers, or municipal traffic and safety authorities.

Service vehicles and school buses must be provided for in the school traffic program.

A community bicycle safety program, sponsored by the school, is outlined.

The school must establish firm legal footing for its traffic control program. This is best done by originating the program in a cooperative planning commission. The school board sets policies for the campus and the city issues ordinances which outline city police authority.

Suggested Readings

A Community Bicycle Safety Program, Association of Casualty and Surety Companies, 60 John Street, New York 38, New York. Suggests in detail how to organize and implement a school-community bicycle safety program.

Access and Parking for Institutions, The Eno Foundation, Saugatuck, Connecticut, 1960. Presents numerous ideas for solutions to school traffic problems. (Sent free on request.)

Corbett, B. L., "Safeguarding School Crossings," Traffic Quarterly, July, 1952, p. 372. Reports the successful employment of women as school crossing guards.

"Life Saving Islands," *Traffic Digest and Review*, July, 1960, p. 5. Discusses the findings of a before and after study of traffic at crossings where islands are installed.

Peters, J. S., "Parking and the School Site," *American School Board Journal*, January, 1958, pp. 17-18. Offers concrete suggestions to planning for school parking spaces.

"Safe Driving Day," *Industrial Arts and Vocational Education*, April, 1959, pp. 119-121. Suggests a practical program for driver safety.

"Start the Young," *Safety Education*, March, 1959, pp. 25-30. Suggests methods and techniques for teaching safety to elementary school pupils.

The Administration of Safety in the New York City Schools, Board of Education of the City of New York, Publications Sales Office, 110 Livingston Street, Brooklyn 1, New York, 1960 ($1.00). Contains detailed information on school safety patrols, fire and disaster drills, bicycle safety, etc.

Wright, J. C., "Order in the Corridor," *Clearing House*, March, 1958, pp. 422-426. Examines the relationship between student morale and good order in school building traffic.

CHAPTER XII

PLANT SAFETY AND HYGIENE

Every school child needs education for safety and protection against accidents and diseases to which modern conditions subject him.

The school must educate for safe and healthful living through instruction, examples, and participation, and must progressively reduce hazards which affect the child's safety, health, comfort, and well-being.

The school plant administrator assumes the major responsibility for initiating and maintaining a well-coordinated, system-wide program of school safety and sanitation.

Safety Program Essentials

School plant management operates under written board policies, which delineate, among its major divisions, the objectives of a program of school safety. It remains for the school executive to implement policy statements with the proper organization, directives, and surveillance, to ensure the desired results.

Philosophy

A section of written policies on safety might include some of the following items:

1. The school will provide and maintain a safe environment--buildings, grounds, equipment, supplies, machinery, heating, lighting, and ventilation.

2. The school will educate for safe living by instruction, example, and participation.

3. Safety education will include constant surveillance for and progressive reduction of hazards to the safety and health of all students.

4. Education and surveillance for safety will make use of continuous research to keep abreast of modern practices in safety.

5. The school will use an accident reporting system and adequate records as an aid to planning and evaluating the safety program.

6. Guidance, supervision, and instruction shall be predicated upon personal responsibility for one's safety and that of others. Due emphasis shall be given to proper knowledge, skills, attitudes, and habits.

7. The school shall provide opportunity in all its activities for pupils to develop the ability to make adjustments for safe living, both present and future.

8. Provision shall be made for democratic participation of children and adults in planning and enforcing rules and regulations designed to promote safe living.

9. Within reasonable limits, funds shall be provided for the correction of deficiencies, and for the continuation of a sound program of safety education.

10. Provision shall be made for cooperation with local groups and agencies in the interest of improving the safety programs of the school and community.

Part of the policies referred to above might well include statements concerning protection to be afforded school personnel by the school board against charges of negligence, or liability in the event of accidents. This will be discussed under Legal Aspects.

Implementing the Program

The superintendent is responsible for implementing the mandates of the school board. His major concern is to delegate authority and responsibility to competent school personnel, and to supervise their activities so as to effect desired results.

A suggested first step in organizing for school safety is a fact-finding tour of the entire school plant. The superintendent might do well to divide the campus into areas and make certain personnel responsible for various surveys, such as:

Grounds--maintenance chief and building principal.

Boiler rooms--chief custodian and superintendent.

Buildings (major)--principals and custodians.

Classrooms--committee of teachers.

Playgrounds (and apparatus)--maintenance chief and coaches.

Gymnasium--coaches and principal.

Electrical--local electrical contractor.

Fire safety--local fire marshal.

The personnel making these surveys should be furnished with checklists to facilitate their work. There is a sample checklist at the end of this chapter.

A planning session is suggested as the next step toward setting up the safety program. This meeting should include principals, supervisors, teachers, custodians, maintenance personnel, students, parents, representatives from the local fire and police departments, and from any safety organizations available.

Guided by school board directives, and by the fact-finding survey results, this group can plan the essentials of a program of school safety, devise rules and regulations, and accept the duties and responsibilities involved in its promulgation.

Finally, the superintendent sees that information concerning the safety program is disseminated; he causes to be printed rules and regulations for students (Student Handbook) and for teachers (Teacher Bulletin); he institutes studies directed toward inclusion of safety education in the curriculum and activities of the school; regular schedules of inspections and reports are set up for building principals, custodians, maintenance personnel, bus drivers, and others whose activities impinge on school safety; he is alert for information and research in the field which may improve his program, and he enlists the support of the community for measures designed to protect the welfare of and enhance the educational opportunities for youth.

The School Staff and Safety

The school building principal must frequently and carefully inspect the safety features of his building and adjacent areas, calling in local fire, safety, and health officials to aid in these surveys, when needed.

The principal is responsible for implementing the policy directives of the school management as applied to the facilities under his supervision. He makes periodic checks to ascertain that faculty and staff members understand all existing safety and health regulations. He is responsible for an evacuation plan and should conduct regular and surprise fire and emergency drills at intervals during the school year.

School custodians can contribute much to the school safety and sanitation program. They have complete knowledge of the operation of all alarms, detecting devices, and all physical features of the plant related to fire prevention, evacuation, and safety. Custodians generally are well-versed in the best methods of hygienic cleaning and health protection. Theirs is a constant job of looking to the safety and health of the people whom they serve.

Custodians notice and report unsafe and unhealthful practices or conditions, and arrange with the building principal their duties and responsibilities under emergency conditions.

All teachers have a two-fold responsibility for the safety and health of their youthful charges: education and protection. Safety in living can be taught. Children can learn facts and principles which will develop attitudes, habits, and skills which lead to safe and healthful living. Such development is enhanced when it is a part of the teaching in all curriculum areas. Attitudes toward health and safety cannot successfully be promulgated in all students in physical education classes alone.

The safety program can be taught in units integrated into the regular curriculum. Another approach is to use special "safety week" programs. (Refer to Chapter XI, p. 149.)

Stenographic and clerical personnel should be included in planning for school health and safety. Students learn from the example of their elders and associates, and all adult school personnel should cooperate in the health and safety effort. Non-instructional personnel have their specific duties in regard to fire drills and emergency procedures.

Safety in Maintenance

A prime area of management responsibility toward safety and health is in the school maintenance program. Good maintenance means safety. Keeping combustible materials in safe containers, fastening loose handrails, replacing faulty stair treads, repairing damaged playground equipment, and keeping fire extinguishers properly charged are but a few examples of what is meant by good building maintenance for safety's sake.

Schools that lack adequate exit facilities and adequate types of automatic sprinkler or detection equipment, and which possess excessive amounts of highly combustible interior finishes, substandard fire alerting means, and poor housekeeping conditions, must be rated as "fire traps." School and fire authorities must take affirmative actions to rid their communities of such blights.

What must be done for fire safety? Robert J. Quinn, Fire Commissioner, Chicago, Illinois, suggests the following:[1]

1. Installation of automatic sprinkler systems in all classroom building spaces.
2. Adequate school fire alarm system, linked to local fire department alarm system.
3. Regular fire drills (at least monthly) with alternated obstructed drills. Teachers briefed before school begins as to sounding alarms, main and alternate escape routes.
4. Regular fire inspections by local fire department.
5. All exits equipped with panic bars and opening outward.

Types of Fires

Some facts about fires and fire extinguishers are:[2]

1. Class "A" Fires: involve wood, paper, rags, rubbish, etc., on which the quenching and cooling effect of water is called for.

Recommendation: The familiar soda-acid extinguisher. Caution, carry it right side up until ready for use.

2. Class "B" Fires: involve small quantities of rapidly burning gasoline, oil, greases, waxes, etc. These blazes need the smothering effect of the extinguishing agent.

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[1] "What Must Be Done for Fire Safety?" American School Board Journal, March, 1959, p. 32.

[2] Dave Smalley, "Some Facts About Fire Extinguishers," American School Board Journal, March, 1959, p. 40.

Recommendation: (a) Foam-type--2 1/2 gallons of liquid generates twenty gallons of foam. Very effective on Class "A" and Class "B" fires; (b) gas cartridge type--advantage over soda-acid in that one can use non-freezing liquids. Recommended over soda-acid extinguisher in cold climates.

3. Class "C" fires: are blazes in electrical equipment where use of non-conducting extinguishing medium is of great importance. In such cases, a stream of water against live wires or connections could cause severe shocks, even electrocution.

Recommendation: (a) Most common type is the vaporizing liquid extinguisher, pump-type tank, using chlorobromo-methane or carbon tetrachloride; (b) the carbon dioxide extinguisher, a horn-like nozzle through which is ejected CO_2 gas which blankets and smothers the blaze. Also recommended for Class "A" and "B" fires, but to be used only at short range, not over eight feet; (c) dry chemical type, small CO_2 cartridge which expels dry chemical through a hose. Newer models operate with a trigger and are very effective and easy to use. One discharge lasts up to thirty seconds.

A note of caution--be sure all equipment carries the "UL" seal (Underwriter's Laboratory approval) and are regularly checked and always fully charged.

Many communities do not begin to consider the need for a fire safety program until a tragedy occurs. Any accident, particularly a fire, not only creates personal and economic distress, but also provokes inquiry as to responsibility, negligence and liability. The school must not wait for accidents to happen. The time to prevent tragedies is before they occur!

Near accidents and minor accidents, cuts, bruises, falls, occur daily in schools and are quickly forgotten. They should not be! They should alert us to faulty habits and attitudes that, ignored, can lead to worse incidents. They should be recognized as warnings to appropriate preventive teaching and action.

Health Program Essentials

Good school management is concerned with sanitation. Sanitary surroundings are vital to the child's welfare and health. School children are entitled to clean classrooms, cafeteria, drinking fountains, rest rooms, and play areas. Clean facilities and equipment reduce the hazard of spreading diseases.

Hazards to Health

Hazards to health are more subtle than physical hazards and are, therefore, more of a problem and call for even greater vigilance. Most sickness and disease affecting school-age children are of a communicable nature--colds, influenza, and the common plagues of measles, chickenpox, etc.

With the advent of antibiotics and improved antitoxins, much of our child disease problem has been checked, but medical science has not eliminated the need for common sense measures of precaution against any sickness which still can and does play havoc with the educational program--to say nothing of what it does to the A.D.A.

The school executive must accept the responsibility of instituting, with school board approval and community cooperation, a sound program of health and sanitation. Some measures found effective by Texas administrators are:[3]

1. Vaccination-inoculation program for elementary school for all major communicable diseases.
2. Yearly vision, hearing, and dental examinations with follow-up studies.
3. Yearly tuberculosis "patch" tests, Lederle tests, or X-ray.
4. Adequate first-aid supplies in all departments and areas where needed (gymnasium, science laboratories, homemaking laboratories, vocational shops, etc.).
5. Regular and efficient application of germicides, cleaners, and deodorants in all rest rooms and dining spaces.
6. Regular use of antibiotic spray in classrooms.
7. Enlistment of city and county hospital corps, doctors, nurses, and health personnel to assist school in inoculations, tests, etc.
8. Program of health instruction as part of the regular curriculum.
9. Training of teachers to recognize signs and symptoms of illness, and to properly administer first aid.

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[3] J. D. Engman (ed.), A Survey of Selected Gulf Coast Schools, 1961.

10. Sick room with bed(s) in each classroom building.

11. Regular, thorough inspection of health program.

12. Health cards (records) on each student.

13. Proper example by staff.

The above is a "minimum essentials" program, and can be instituted at little extra cost. Beds and mattresses can be obtained at small cost through the Texas Surplus Property Agency; county health officers can furnish much inoculation material at state expense; local and county dentists and nurses, if properly approached, will donate time for dental examinations. Local P.-T. A. groups and women's clubs can and do handle simple devices for eye and ear testing. Civic and luncheon clubs furnish dental care and eyeglasses for indigent pupils. Forms for inspection, for recording examinations, and for health records can be printed on the school duplicator. Teachers and custodians can be quickly trained in proper first-aid and sanitation techniques. It remains for the administrator to periodically check the various phases of his program to ensure that all is being done to properly safeguard the health of students and staff.

Comfort Features

In considering the scope of the health-sanitation program, the school plant administrator will not want to overlook the collateral aspects of comfort features, which add so much to the general welfare of staff and students.

Features for comfort include provision for rapid heating, air for cooling and ventilating, automatic controls, and easily operated windows. Children require cooler temperatures than adults. They work more efficiently at lower temperatures. The amount of take-home learning definitely is related to the bodily comfort of the child.[4] This comfort is effected by proper temperature, humidity control, and ventilation.

Adequate light is another major consideration for comfort and health. The amount of light necessary for visual acuity is important. Substandard lighting not only can produce eyestrain but also tension due to discomfort, and may lead to lowered pupil achievement. Thirty foot-candles of light at each pupil station is the minimum for lighting standards.[5] This is not to neglect adequate lighting for chalkboards, display areas, and passageways.

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[4] N. L. George, The School Plant and the Instructional Program, Oklahoma Commission on Educational Administration, 1957, p. 5.

[5] Ibid., p. 6.

An additional necessary feature for comfort and health is hearing ease. The importance of noise control cannot be overemphasized. Noise retards the learning process and causes undue mental and physical fatigue. Space does not here permit extensive treatment of the mechanics of sound control. Briefly, this may be effected in three ways, by (1) sound insulation, (2) by sound absorption, and (3) by sound elimination. Outside noise can be kept outside; interior sound can be muffled by proper insulating materials; and some noise can be eliminated by moving them away from classroom centers or, through training, reduce certain sounds to an absolute minimum.

Legal Aspects

Injuries to pupils and others on the school campus, on the way to and from school, or on trips connected with school activities, frequently raise the question as to whether the person so injured may recover damages, and, if so, who is responsible.

The Law and Liability

It may be of interest to school administrators to know what Texas public school law has to say concerning school liability and negligence.

> A school district is an agency of the State and is not answerable in law suits for its negligence while exercising governmental functions.[6]
>
> A school board is not liable in damages for acts done in discharge of official duties, except for wilful or malicious acts or.....excessive abuse of discretion.[7]
>
> School districts are not liable for injuries inflicted as a result of negligence of employees or as a result of conditions of buildings and grounds.[8]
>
> A school district is not liable for damages for injuries suffered by a student participating in a football game or while traveling to or from a game

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[6] J. C. Hinsley, Handbook of Texas School Law (Third Edition), (Austin, Texas: The Steck Company, 1957), p. 397.

[7] Ibid., p. 381.

[8] Ibid., p. 368.

> on a school bus, regardless of whether or not a portion of the student body is insured by the school board against such injuries.[9]

The foregoing legal interpretations would seem to obviate the necessity of any safety program at all, but, of course, this is not the intent of the law. The school board and the administration are bound by ethical, moral, and educational standards to exercise all reasonable and prudent means to effect the health, safety, and well-being of every child in their care.

This acceptance of responsibility should be reflected in the written school board policies.

The Law and School Health

Public school law in Texas is quite positive as to its application in regard to school health. For instance:

> The board of trustees of an independent school district has the authority to require children to be vaccinated for smallpox before attending school.[10] This also may be applied to diptheria and polio vaccinations.[11]

Article 4477 of the Texas Statutes is known as the Sanitary Code[12] and lists among its provisions:

> Rule 15. Persons suffering from measles, mumps, whooping cough and chicken pox, shall be required to be barred from school for twenty-one days..... from date of the onset of the disease; to be readmitted on a certificate.....attending to their recovery and non-infectiousness.
>
> Rule 27. Schools temporarily closed: Where smallpox, scarlet fever or diptheria is found.....shall be deemed infected, and closed until thoroughly disinfected and cleaned under the supervision of local health authorities.

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[9] Ibid., p. 368.

[10] Ibid., p. 441.

[11] Ibid., pp. 173-326.

[12] Ibid., p. 1044.

Article 4477-1, concerning sanitation in schools, lists the following mandates:

> Section 6(a). All school houses shall provide and maintain sanitary toilet accommodations.
>
> Section 16(a). School buildings shall be located on grounds that are well drained and maintained in sanitary conditions.
>
> Section 16(b). School buildings shall be properly ventilated, provided with adequate supply of sanitary drinking water, approved sewage disposal, hand-washing facilities, a heating system, and lighting facilities, all of which shall conform with established standards of good public health engineering practices.
>
> Section 16(c). All school lunch rooms.....shall comply with the State Food and Drug Regulations.
>
> Section 16(e). All building custodians.....shall be versed in the fundamentals of safety and school sanitation.

The above are a few of the state laws relating to public school health. These are mandates which through years of research and practice have resulted in a system of approved health engineering practices.

The best practical advice to the schoolman in setting up a health-sanitation program is to consult and cooperate with local and state health authorities. Their activities are legally constituted as well as being professionally and technically correct.

Summary

The school plant administrator is responsible for the safety, health, comfort, and welfare of all pupils under his control. He must realize that conservation of life depends upon the education these youngsters receive regarding safety and health.

School plant management implements school board policy statements with proper organization and directives to achieve optimum results.

The policy statement of philosophy is the first step toward setting up a program of health and safety. This is followed by a fact-finding commission and a planning session, using all available community resources.

The school administrator's major duty toward the school health-safety program is to delegate responsibility to competent people and to supervise their activities to the end that desired goals are achieved.

Inspections with checklists are suggested as being indispensable to the functioning of a sound program of physical safety, fire safety, and health protection.

Economical, common sense measures in organizing for a health program include the use of professional city and county health officials, doctors and nurses, in a cooperative effort.

Legally, a school district cannot be held liable for accidents or injuries resulting from negligence of school employees in the discharge of their duties, but all morality, ethics, and sound educational practice insist that school board policies and programs be directed toward protection of the life and health of children, and to education for safe living.

The experienced practitioner in school plant management organizes and operates his school in such fashion as to safeguard himself and his staff against charges of negligence. In this regard, the importance of constant surveillance cannot be overstressed.

The essential elements in managing the school plant program of safety and health are:

Inspect regularly and thoroughly all aspects of the school plant relating to health, safety, and well-being.

Correct any hazardous conditions.

Train teachers, employees, and students in use of equipment, in conduct of drills, and in observance of sanitary rules and regulations.

Provide adequate protection for safety and health.

CHECKLIST FOR SCHOOL SAFETY

"Yes" answers indicate satisfactory conditions as far as safety is concerned.

A "No" answer to a question indicates a serious and major danger which requires immediate attention.

Part I. Site and exterior

1. Are entrances to the school grounds free of blind spots created by shrubbery or other obstacles? Yes_____No_____

2. Are sidewalks on the school site laid out so that a minimum amount of crossing the service drive is required of pupils? Yes_____No_____

3. Are all driveways approaching the buildings located so that they do not cross play areas or pupil routes to these areas? Yes_____No_____

4. Is the bus unloading area designed so that there is no necessity for any bus to back up? Yes_____No_____

5. Are swings and slides and other playground equipment so placed as to minimize the likelihood of collisions between pupils? Yes_____No_____

6. Is the surfacing of the play areas relatively smooth and free of abrasive surfaces, obstacles, protrustions, stones, etc., that might cause pupil injury? Yes_____No_____

7. Have safety fences been erected for pupil protection where traffic hazards or similar dangers exist? Yes_____No_____

8. Are all high voltage wires and transformers fully shielded from pupil access? Yes_____No_____

9. Are all exterior fire escapes secure and well maintained? Yes_____No_____

10. In the case of open fire escapes passing by windows, are such windows provided with fire-resistant sash and wired-glass panes? Yes_____No_____

Part II. Basement or Lower Level

11. Is the boiler room located so that it is not directly below spaces occupied by pupils and teachers? Yes_____No_____

12. Is there an appropriate type of fire extinguisher strategically located in the boiler room? Yes_____No_____

13. Have all the fire protective automatic devices related to the heating plant been checked within the past six months? Yes_____No_____

14. Is the boiler room constructed of non-combustible material throughout? Yes_____No_____

15. Is the boiler room free from the accumulation of combustible materials, such as waste paper, used desks, and old books? Yes_____No_____

16. Are spaces used for storing combustible materials, such as cleaning agents, paints and paint thinner, gasoline and power mowers, enclosed by fire-resistant construction? Yes_____No_____

Part III. Floor Levels

17. Do all exits (emergency and normal) open outward? Yes_____No_____

18. Do all exit doors open freely and have panic bars in working order? Yes_____No_____

19. Are all exits, including those in the gymnasium, auditorium and other large group areas, clearly marked? Yes_____ No_____

20. Is the building provided with a fire protective system (sprinklers, hydrant and hose, etc.) appropriate for the degree of fire resistance incorporated in the structure? Yes_____No_____

Part IV. Stairways and Corridors

21. Are all stairs used by pupils well illuminated? (Preferably by natural light.) Yes_____No_____

22. Are stairways provided with well-maintained and secure handrails? Yes_____No_____

23. Are stair treads' surfaces of the type which prevent slipping? Yes_____No_____

24. In corridors, are fire extinguishers, drinking fountains, and radiators properly recessed? Yes_____No_____

25. Are fire extinguishers furnished and so located that one is available within 100 feet of any point in the corridor? Yes_____No_____

26. Does the main corridor contain at least two widely separated exits? Yes_____No_____

27. Are all main corridors at least 8 feet wide in the clear? Yes_____No_____

28. Are all corridors completely free from furniture or other material that would impede the flow of pupil traffic? Yes_____ No_____

29. Are all points in the main corridor within 150 feet of an exterior door? Yes_____No_____

30. Are vision strips provided in doors leading from classrooms to corridors? Yes_____No_____

Part V. Specialized Areas

31. Are power tools checked for electrical shock hazards? Yes_____No_____

32. Do pupils using power machinery wear goggles and special clothing which are designed to protect them from accidents? Yes_____No_____

33. Are oily wastes in shop areas, laboratories, basement, and other areas stored in metal containers? Yes_____No_____

34. Are extinguishers of the proper type provided in shops, kitchens, homemaking rooms and laboratories? Yes_____No_____

35. Does the auditorium have two or more widely separated exits? Yes_____No_____

36. Is there an apron extending at least three feet in front of the stage curtains in the auditorium? Yes_____No_____

37. Does the cafeteria have two or more widely separated exits? Yes_____ No_____

38. Does the gymnasium have two or more widely separated exits? Yes_____ No_____

39. Are floors in all shower areas of the non-slip type? Yes_____ No_____

40. Are effective fume hood or exhausts provided in areas where noxious gases are produced, such as chemistry and physics laboratories and automotive shops? Yes_____ No_____

Part VI. Miscellaneous

41. Is there a regularly tested and operating fire-alarm system in the school? Yes_____ No_____

42. Is waste paper stored in a fireproof place or disposed of each day? Yes_____ No_____

43. Are all electrical distribution boxes safe from pupil access? Yes_____ No_____

44. Have all fire protective systems, such as sprinkler systems, [illegible] and fire extinguishers, been inspected and tested within the past six months? Yes_____ No_____

45. Is the building interior free from danger of falling objects, such as loose plaster, equipment stored on top of wall cabinets, and insecurely fastened fixtures and ornaments? Yes_____ No_____

46. Have all electrical wiring and outlets been checked for defects and shock hazards within the past six months? Yes_____ No_____

47. Have all gas tubing and outlets been checked for defects in the last six months? Yes_____ No_____

48. Is there a master gas supply shut-off valve in every room in which gas is used by pupils? Yes_____ No_____

49. Are fire and disaster drills held as often as local and state laws demand? Yes_____ No_____

50. Is a system provided which encourages pupils, teachers, custodians, and others to report dangerous conditions that they see about the schools? Yes_____ No_____

Editor's note: The above checklist was adapted from a similar list prepared by M. R. Sumption and Basil Castaldi of the Office of Field Services, University of Illinois, Urbana, Illinois.

Suggested Readings

"Accidents in the Secondary Environment," Pamphlet, Oklahoma State Department of Education, Oklahoma City, 1960. Defines the problem of high school accidents and suggests steps toward a program of prevention.

Fire Prevention and Engineering Bureau of Texas, 520 Mercantile Securities Building, Dallas, Texas. Provides free films on fire safety. Write for free film list.

George, N. L., The School Plant and the Instructional Program, Oklahoma Commission on Educational Administration, Oklahoma City, 1957. Emphasizes the importance of planning for safety, comfort, and well-being of pupils when constructing a new school plant.

Health Manual for Schools, State Department of Education, Richmond, Virginia, 1960, T. T. Hamilton, Director of Publications. Provides a thorough organizational study of the school health education program in the Commonwealth of Virginia.

Higgins, T. J., "Check List for Safety in Schoolhouse Construction," Safety Education, January, 1954, pp. 8-10. Proposes thoughtful and economical measures to insure safety in building new schools.

Hinsley, J. C., Handbook of Texas School Law (Third Edition), The Steck Company, Austin, Texas, 1957. Concisely outlines all existing Texas Public School Laws (through 1957), constitutional and statutory, including notes on pertinent court decisions and opinions of the state Attorney General.

Irwin, Leslie W., and others, *Methods and Materials in School Health Education*, The C. V. Mosby Company, St. Louis, Missouri, 1956. Suggests ideas in programming and implementing a sound program of health education for the public school.

Safety Instruction Outline, Department of Public Safety, Austin, Texas. Offers many good suggestions applicable to school safety precautions and safety education.

School Safety Service, Texas Safety Association, Inc., 830 Littlefield Building, Austin, Texas. Furnishes, at a nominal fee, a complete safety instructional program for all grade levels, including posters, displays, safety library with index, and *Safety Education* magazine subscription.

Smalley, Dave, "Some Facts About Fire Extinguishers," *American School Board Journal*, March, 1959, p. 40. Outlines methods by which to combat various types of fires.

The Administration of Safety in the New York City Schools, Board of Education, City of New York, 110 Livingston Street, Brooklyn 1, New York, ($1.00). Provides a complete reference to regulations and procedures applying to general situations involving the safety of pupils at all school levels.

The Administrator's Guide for the School Health Program, Department of Education, The Commonwealth of Massachusetts, 1957. Provides a valuable source of ready reference for administrators interested in appraising and improving the school health program.

"What Must Be Done for Fire Safety?" *American School Board Journal*, March, 1959, p. 40. Discusses phases of programming for fire safety. Entire issue is devoted to fire safety.

CHAPTER XIII

MODERNIZING EXISTING STRUCTURES

When the educational program begins to suffer due to lack of space, lack of proper lighting, heating, ventilation, etc., it is time for school plant management to conduct a study of needs and costs to put the school plant back into adequate educational function.

When the "looks" of a school plant do not contribute to an over-all learning-belonging attitude on the part of students, staff, and public, a change for the better is definitely indicated.

School management responsibility consists in being able to assess these values and to communicate them to the school board, to know the capability of the district financially to make necessary alterations, and to resolutely push carefully-planned remedial programs to fruition.

Criteria for Modernization

When improving an older structure, a school district has a priceless opportunity to correct inadequacies in the existing plant. Here are a few questions that schoolmen ask themselves:

1. Shall we add to the old structure, or would a new building in a new location be the best solution?

2. Must the old building be used for the same grade levels, or can it be converted "up" or "down?"

3. Will the existing facilities (cafeteria, gymnasium, etc.) be adequate if we put an addition to the old structure?

4. What is the economy of spending money on modernization of the old plant when we make an addition?

5. What are the long-range advantages and economies of additions or modernization against new building?

The prime purpose in any addition or remodeling program is generally to upgrade the entire plant. The total process need not be costly. It does require clearly-defined objectives on the part of the school board and the administration--and some imagination.

The purpose of alterations to existing school plant facilities is to provide, as nearly as possible, an equivalency to the contemporary idea of modern school plants. Consequently, the basis for any program of alterations should be today's accepted standards for stairways, exits, fire-resistive materials, and other safety features; sanitary features, heating and ventilation comfort, sound control, illumination, and other health protection features; space requirements, storage facilities, and adequate teaching features.

CHECKLIST OF LIMITING FACTORS

IN MODERNIZATION

- Funds available.
- Legal authority (bond election).
- Bonding limitations.
- Interference with instructional program.
- Prior work necessary (i.e., shoring up foundation before building wall).
- Seasonal factors (weather).
- Labor supply.
- Priorities (number of projects).

CHECKLIST OF DETERMINING MODERNIZATION NEEDS AND COSTS

- Will there be need for a school at this location for an extended period? (Enrollment studies.)
- Can the pupils be accommodated now or at some future time without modernizing or replacing the building?
- Is the present site suitable for continued school use?
- Is the site sufficiently large? If not, can it be enlarged?
- What deficiencies, if any, exist in the structure or in its mechanical service systems?
- Does the structure present insurmountable or serious obstacles to alteration, remodeling, and expansion
- What must be done to make the structure conform to minimum state or local educational standards?
- What must be done to make the structure conform to state or local health and safety codes?
- What would it cost to modernize the structure satisfactorily?
- What would it cost to replace the building?
- Would differences in educational space standards, periods of probable usefulness, and subsequent costs of insurance, operation, and maintenance offset any immediate savings through modernization?

Procedures in Modernization

Good plant management is merely good business management. The astute school executive stays ahead of the game. He will not let grass grow too long, nor allow dirt to accumulate, paint to peel, plaster to crack, or roofs to leak. Neglect fosters deterioration, hastens obsolescence, and forces costs up far beyond what is needed for reasonable routine maintenance.

Standards

The score forms appearing in this chapter, for determining substandard conditions in the school plant, are based on accepted standards of functional integrity, from an aesthetic, educational, and structural standpoint. These standards for school plant administration may be found in various sources, some of which are suggested here:

Texas Education Agency (School Plant Section)

Texas Association of School Administrators

Texas Safety Association

Texas Department of Public Safety

Texas Department of Public Health

U. S. Department of Health, Education and Welfare

National Education Association

National Library Association

State Teachers Organizations (English, science, etc.)

American Association of School Administrators

Random examples of general standards will include: 30 foot-candles of illumination at each pupil station in classrooms, 30 square feet of space per pupil in science laboratories, a fire extinguisher within 100 feet of any classroom, no more than 40 pupils in a classroom, school building roofs should be at least 20-year bonded construction, one fire escape for each 100 pupils, etc. Standards are flexible. They must be tailored to fit local conditions.

Standards may also be derived from purely local sources. The committee method is one means of arriving at "ideals" in particular areas. For example, a group of elementary teachers may study the problem of "adequacy" in blackboard space. They may arrive at a practical (local) standard of two square feet per pupil. School staff studies, assisted by local engineers and craftsmen, can evaluate the school plant and make recommendations for improvements. Checklists such as appear in this chapter (pp. 180-181) may be used for studies of this type.

Writing Specifications

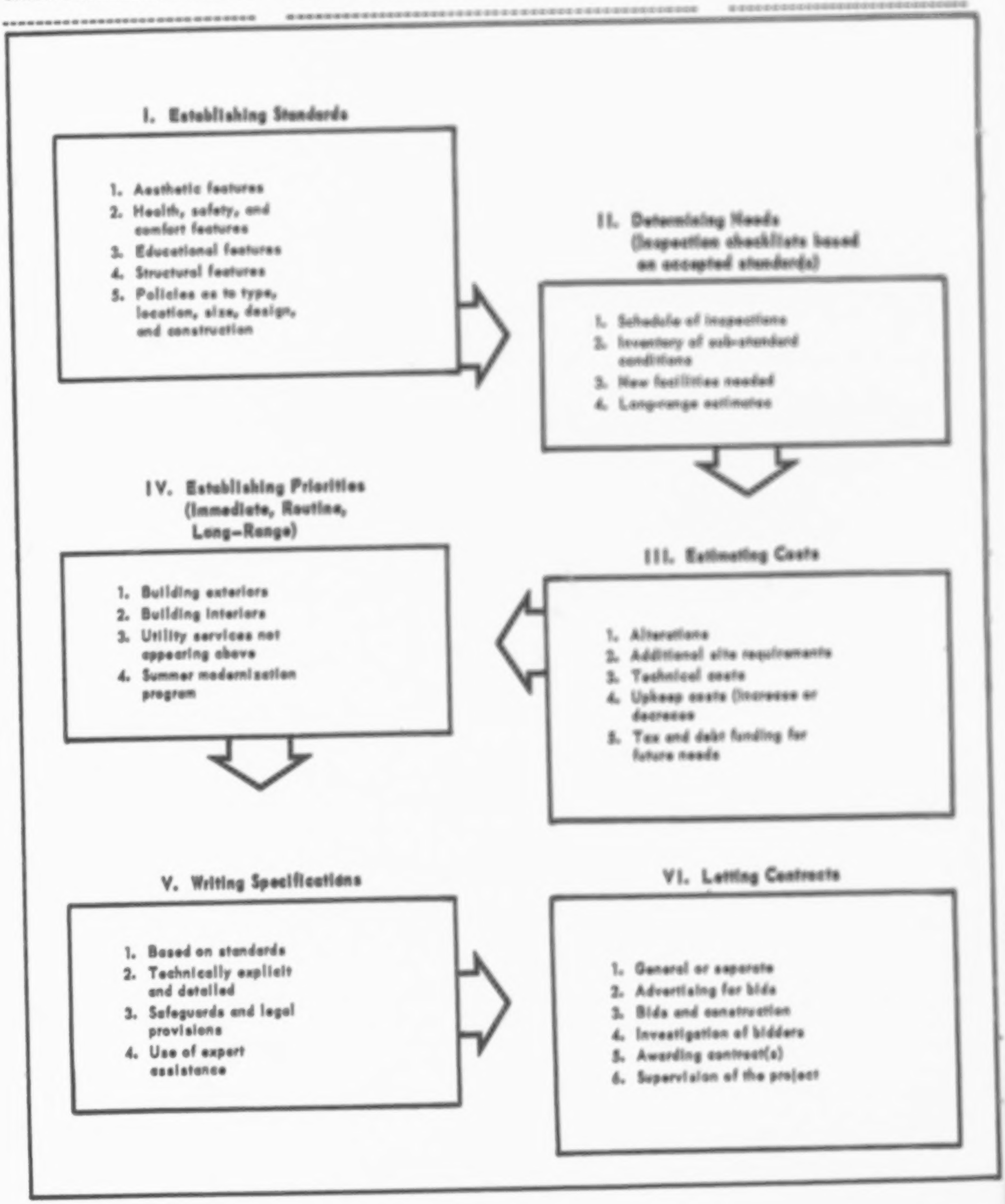
Specifications for any given job of adding-altering are based on the educational goals of the area to be served. Project specifications need to be clearly and explicitly written, with legal safeguards included. These safeguards are protections for the school, such as performance bonds for the contractors, supervisory guarantees, material quality warranties, etc.

Who writes the specifications? Architects, contractors, subcontractors, tradesmen, and craftsmen--most of these people are competent writers of specifications and can be prevailed upon to help in this work. The school executive can assist these professional technicians by furnishing data as to educational needs as a basis for formulating specifications. Some of these educational needs, or goals, might be:

1. Flexibility, for functional planning.
2. Adaptability to changing conditions.
3. Provision for individual differences.
4. Provision for self-instruction.
5. Grouping needs; large or small groups.
6. Staff utilization, team teaching.
7. Multi-structured scheduling (departure from traditional 5-hours per week for all subjects).

Modern Technical Aspects

Modern technology and the wide choice of versatile construction materials make it possible for planners to design great flexibility into buildings simply and inexpensively. "Flexibility" in modern school engineering may have meaning to those planning for alterations or addition to present structures. It suggests better utilization of existing spaces and an economical consideration for modernization


I. Establishing Standards
1. Aesthetic features
2. Health, safety, and comfort features
3. Educational features
4. Structural features
5. Policies as to type, location, size, design, and construction
II. Determining Needs (Inspection checklists based on accepted standard(s)
1. Schedule of inspections
2. Inventory of sub-standard conditions
3. New facilities needed
4. Long-range estimates
III. Estimating Costs
1. Alterations
2. Additional site requirements
3. Technical costs
4. Upkeep costs (increase or decrease
5. Tax and debt funding for future needs
IV. Establishing Priorities (Immediate, Routine, Long-Range)
1. Building exteriors
2. Building interiors
3. Utility services not appearing above
4. Summer modernization program
V. Writing Specifications
1. Based on standards
2. Technically explicit and detailed
3. Safeguards and legal provisions
4. Use of expert assistance
VI. Letting Contracts
1. General or separate
2. Advertising for bids
3. Bids and construction
4. Investigation of bidders
5. Awarding contract(s)
6. Supervision of the project

FLOW CHART FOR MANAGEMENT OF MODERNIZATION PROCEDURES

Figure 11.

plans. Caudill[1] defines flexibility as four qualities of space: *fluidity* (movable separations which allow spaces to flow together), *versatility* (the multiple use of space), *convertibility* (use of space dividers), and *expansibility* (extending space at minimum cost).

Current trends in modern educational technology which alter the space requirements of school buildings are illustrated by climate control, new teaching equipment, and team teaching.

Climate Control

The use of air conditioning has encouraged several design trends--lower ceilings, less glass area, and more compact units through reduction of corridor space have resulted. School boards have, until very recently, been slow to plan and build air conditioned buildings. This has been due to two factors--costs and public antipathy toward "frills."

Evidence is mounting to show that completely air conditioned, compact schools can be and are being built for even less than equivalent conventional buildings which are not air conditioned.[2]

Dayton Independent School District, Dayton, Texas, recently constructed (1961) a completely air conditioned 22 classroom facility. A study of comparative costs indicates that compact air conditioned schools may be built and owned with less expense than buildings without air conditioning.[3]

Cost savings in general construction are more than enough to offset the increased mechanical cost.[4] These savings are possible because of reduced structural design, less exterior and interior wall footage, elimination of windows, reduced capacity of heating plant, and many other factors that result from the use of a compact school plan.

Air conditioning provides maintenance and operating savings that studies show will more than exceed increased costs of additional mechanical equipment and utilities. These savings result from less expense of winter heating due to diminished heat loss because of

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[1] William W. Caudill, *Toward Better School Design*, F. W. Dodge Corporation, New York, 1954, p. 4.

[2] *Proceedings of the School Facilities Conference*, College of Education, The University of Houston, March, 1961, p. 19.

[3] *Ibid*., p. 37.

[4] *Ibid*., p. 19.

Score 1 to 5 points on each item as to need for improvement:

1 -- Very poor condition, immediate repairs needed.
2 -- Poor condition, repairs necessary soon.
3 -- Fair condition, some improvement needed.
4 -- Good condition, only minor adjustments needed.
5 -- Excellent condition, only routine maintenance necessary.

Low scores (1, 2) indicate substandard conditions and may also be used as priority basis for local consideration.

I. Outdoor Features (35 possible)

Score

- Grounds. (Lawns, trees, shrubs, etc.) ☐
- Installation. (Gates, fences, walks, parking areas, etc.) ☐
- Normal grounds drainage. ☐
- Playground areas and equipment. ☐
- Athletic fields and equipment. ☐
- Total building configuration ([illegible], orderly.) ☐
- Additional measures to improve educational, recreational, aesthetic features. ☐

Total ☐

II. Health, Safety and Comfort Features (55 possible)

Score

- Building and site conform to local and state safety codes. ☐
- Building and site conform to local and state health standards. ☐
- Heating-ventilating system. ☐
- Building illumination. ☐
- Noise, odors, glare in instructional spaces. ☐
- Conditions of mechanical services. (Drinking water, plumbing, electrical outlets and switches, sinks, vents, etc.) ☐
- Student rest rooms. ☐
- Teachers' lounges, restrooms. ☐
- Student lockers. ☐
- Custodial spaces. ☐
- Fixed protective devices. (Fire alarms, night lights, etc.) ☐

Total ☐

III. Educational Features (45 possible)

Score

- Classroom space. (Overcrowding?) ☐
- Condition of desks, chairs, tables. ☐
- Laboratory space (science, languages, vocational, etc.) ☐
- Chalkboards, bulletin boards. ☐
- Classroom storage space. ☐
- Library storage and shelving. ☐
- Corridor display spaces. ☐
- Office spaces. ☐
- Needed instructional equipment which might call for building alterations. ☐

Total ☐

IV. Structural Features (65 possible)

Score

- Building foundations. ☐
- Exterior walls. ☐
- Roofs. (Note bonded terms, age, probable replacement date.) ☐
- Gutters, downspouts, flashings. ☐
- Exposed wood, metal surfaces. ☐
- Exit-entrance doors. ☐
- Utility service connections. ☐
- Interior walls. ☐
- Stairways. ☐
- Doors, windows, fire escapes meet local and state fire safety standards. ☐
- Floors and floor coverings. ☐
- Ceilings. ☐
- Structural changes needed (partitions, walls, etc.) to improve instructional program. ☐

Total ☐

Grand Total ☐

Grand Total Possible 200

Score Form for Determining Substandard Conditions of School Plant

Figure 15.

increased insulation; less outside wall and window area maintenance; clean air results in less custodial costs for cleaning, less painting and redecorating. Experience indicates that custodians can maintain 40% more floor area in a completely air conditioned school. This will enable the school to employ fewer custodians and result in a substantial saving in salaries.[5]

Air conditioning is so widely used in business and industrial facilities, and in so many modern school plants across the nation, that the word "frill" is no longer a valid objection. Modern technology has lowered installation costs, and schools have found practical educational values in climate controlled buildings.

Aside from cost savings in construction and operation of air conditioned school buildings, there are significant educational values to be considered. An enhanced learning environment results from proper light distribution, improved sound control, less outside distraction, and control of air temperature, humidity and movement. All of the classroom wall space may be used for educational purposes and classroom activities, including audio-visual aids, can be carried on with less interference with other classes. It is agreed also that healthful conditions will reduce absenteeism due to colds, which in turn will result in financial gain due to increased attendance.[6]

New Teaching Media

Television is another important factor in future school planning. No longer an experimental aid to education, television is an integral part of instruction in almost every state.[7] Hundreds of thousands of students are receiving regular instruction by television as this is written, and this is only the beginning. The increasing use of television, of audio tapes and records, of visual films, filmstrips and slides, and of teaching machines, all add weight to any study of educational needs.

The growth in use of equipment in education will call for further reappraisal of modernization plans. With the added impetus given by the National Defense Education Act, school districts can and are improving science and language laboratory facilities with federal funds matching local effort in remodeling and altering programs.

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[5] *Ibid.*, p. 19.

[6] *Ibid.*, p. 59.

[7] *Teaching By Television*, (New York: Ford Foundation, 477 Madison Avenue, New York, 1959), p. 2.

Team Teaching

The burgeoning educational technique of team teaching is a factor to be considered in planning for altering of existing buildings or spaces.

The intelligent multiple use of space is one way to achieve economy while, at the same time, freeing the school from the domination of the "box." One factor that has long delayed this is the lack of an operable wall, a wall which provides good speech privacy, and, at the same time, may be removed or replaced at will by a teacher. Large spaces are divisible and smaller spaces can be added. No such wall can now be purchased for less than $25.00 per square foot; this is too costly to be feasible for most public school situations, but there is a more economical wall being designed and field-tested. Research and competition should bring prices within the reach of most school budgets. This should prove a valuable asset to modernization planners wishing to take advantage of new teaching media and methods.

Portable Classrooms

When additional classrooms are needed as the result of sudden population influxes, and when there is not time enough and money enough to build new buildings or additions, many schools resort to temporary and prefabricated buildings. Memphis, Tennessee, uses demountable and portable schoolrooms, prefabricated at Memphis by "Demoport." These rooms are 20 feet by 32 feet, seat 30 pupils, cost $3,200.00 for fabrication, $800.00 for erection.[8] The Corpus Christi, Texas, public schools keep on reserve several portable classrooms to be moved to areas as needed. The Building Trades classes at the Brazosport Senior High School, Freeport, Texas, have, as a part of their activities, built residences which the school system moves to fast growing schools for use as classrooms.[9] In El Paso, Texas, the school board purchases residences in new subdivisions for use as temporary classrooms, then disposes of them as residences when new school buildings are completed.

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[8] "Portable Rooms for Crowded Schools," School Management, April, 1960, p. 90.

[9] J. D. Engman (ed.), A Survey of Selected Gulf Coast Schools, 1961.

Summary

When the educational program begins to suffer due to lack of, or obsolescence of facilities, it is time for school plant management to conduct a survey of needs and costs to put the school plant back into educational function.

Improving an existing structure presents an opportunity to correct inadequacies in the old plant. This is the primary purpose of any remodeling program. The end result of any program of modernization of facilities is to provide an equivalency to the contemporary idea of modern school plants.

Procedures for organizing a program of plant modernization are suggested, and sample score forms for determining substandard conditions are supplied. A flow chart for management of these procedures is provided.

Modern technology has made it possible for school planners to design great flexibility into buildings. Current trends in climate control, new teaching media, and team teaching have altered space requirements of school buildings.

Rapid population growth and movement have resulted in serious classroom shortages for many schools. Examples are given as to how some schools are attacking this problem.

Suggested Readings

"A Zoned Compact Plan for a Basic Academic Program," *American School Board Journal*, January, 1961, pp. 20-23. Shows a new high school in Kearney, Nebraska, designed by William W. Caudill, of Caudill, Rowlett and Scott, Architects, of Houston, Texas, featuring an "academic hub" and surrounding "activity zones."

"Can Portable Classrooms Help Your District?" *American School Board Journal*, January, 1961, pp. 54-55. Explains how portable classroom units have been used advantageously by school systems to afford relief from shifting enrollment problems.

Caudill, William W., *Toward Better School Design*, F. W. Dodge Corporation, New York, 1954, p. 4. Presents a highly readable thesis of modern, artistic concepts of design in school facilities.

Planning Schools for New Media, Portland State College, Division of Education, Portland, Oregon, 1961 ($1.00). Presents a guide for school planners accentuating effective use of modern media of instruction.

"Portable Rooms for Crowded Schools," *School Management*, April, 1960, p. 90. Suggests solutions to problems of overcrowded classrooms.

Proceedings of the School Facilities Conference, College of Education, The University of Houston, March, 1961, p. 19. Digests the proceedings of a conference on school building facilities, with comments by various outstanding professional people.

Secondary School Plant Planning, National Council on Schoolhouse Construction, The Council, Peabody College, Nashville, Tenn., 1957. Contains among many fine suggestions, an excellent chapter (VII) on the balanced conditioning of spaces for education.

Strevell, Wallace H., and Arvid J. Burke, *Administration of the School Building Program*, (New York: McGraw-Hill Book Company, 1959). Comprehensively examines the school building program and offers valuable specific information for the administrator.

Teaching by Television, The Ford Foundation, 477 Madison Avenue, New York 22, New York, 1959. Furnishes a statistical report on a nation-wide study of the growth of television as a teaching medium.

Viles, Nelson E., *School Buildings: Remodeling, Rehabilitation, Modernization, Repair*; U. S. Office of Education, Bulletin 17, 1950; Federal Security Agency, Washington, D. C. Covers intensively the phases indicated in the title.

What to do About Old School Buildings, (modernization vs. replacement handbook), New York State Department of Education, Albany, 1954. Provides a practical yardstick for the administrator faced with the problem of modernizing or replacing old buildings.

Some Suggested Sources of Information on Climate Control:
Air Temperature, Inc., (Westinghouse), 1309 C, Driscoll, Houston, Texas.
American Air Filter Company, Inc., Louisville, Kentucky. Booklet, "Fact Kit."
Carrier-Houston Corporation, 7007 Katy Road, Houston, Texas.
Chrysler-Airtemp, Dayton 1, Ohio, Booklet, "Climate by Chrysler." Also at 903 Sampson, Houston, Texas.
Janitrol Heating and Air Conditioning, Columbus 16, Ohio.
Lennon Industries, Inc., 200 S. 12th Avenue, Marshalltown, Iow. Booklet on schoolroom heating and air conditioning.
Minneapolis-Honeywell Company, Minneapolis, Minnesota. Brochure, "Air Conditioned Schools."
Modine Manufacturing Company, Racine, Wisconsin, Bulletin 757.

CHAPTER XIV

SCHOOL BUSINESS OFFICE

Any business must, to be successful, operate on sound business principles, which insist on an accurate accounting of every item of asset and liability, and must keep adequate records, spend money wisely, and protect the public investment. In this respect, school plant management is no different than other business operations; it requires careful application of sound business principles to the effective expenditure of public funds.

The business management of a school exists to implement the administration of the instructional program. All other purposes should be kept subordinate to this primary function.

This chapter will deal with the organization of the business office, and the management aspects of some of its major functions.

Organization

The business administration of schools is an executive management function. As such, it comes under the direction, supervision, and responsibility of the superintendent.

In this country, two theories prevail as to the position of business management in the administrative structure of school systems. Ninety per cent of the nation's schools use the unit plan, in which the business office is directly responsible to the school executive head, whereas ten per cent use the dual (multiple) type of organization in which the functions of educational administration and business affairs are coordinate in character and functions and each is responsible to a board of trustees.[1]

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[1] Henry H. Linn, *School Business Administration* (New York: The Ronald Press Company, 1956), p. 22.

In the Texas Gulf Coast area, among schools of 5,000 A.D.A. and smaller, the unit plan is found exclusively. In schools smaller than 500 scholastics, commonly the superintendent is his own business officer.[2]

In establishing policy, the school board will have to decide on the organizational plan to be used. The "unit control" plan is strongly recommended.[3] Under this plan, the final executive responsibility in all areas resides with the superintendent. Thus, the position of business manager is subordinate to that of the chief executive officer. This type of organization tends to promote a unity of purpose and action which facilitates effective management of the school's business affairs. The school board does not have to decide between two top executives and can concentrate on its policy-making role.

Legal Aspects of Business Management

Underlying administration of the business affairs of a school district is the legal basis upon which it rests. Because the public school is financed out of public funds, it is obvious that the state is concerned in safeguarding all activities associated with its management and operation. When the business manager acts as board secretary, as he often does, or is responsible for specific duties pertaining to insurance, bonds, transportation, payroll deductions, and the like, he is subject to statutory requirements and directives on a federal, state, and local basis. This does not mean he need be an attorney; such counsel can be secured as needed, but he must be familiar with basic laws, directives, and procedures so that he can carry out his duties efficiently and without embarrassment to the local board or citizens. The Texas Education Agency has outlined the responsibilities of the school business official in a new (revised) edition of "Budgeting, Accounting, and Auditing" (Texas Education Agency, 1961, Bulletin 613, Austin, Texas). This publication is designed to standardize Texas public school accounting practices, whereby many school systems will be able to achieve more efficient and economical business office procedures.

Need for a Business Manager

In determining the need for a business manager in school districts, the emphasis should lie more on the quality of the educational program desired by the community than on the size of the enrollment. The best criterion here seems to be that the chief responsibility of the school administrator is the administration of the instructional program, and as business matters begin to require a disproportionate share of his time, a school superintendent should be given relief in business management.

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[2] J. D. Engman (ed.), *A Survey of Selected Gulf Coast Schools*, 1961.

[3] Henry H. Linn., *op. cit.*, p. 23.

Delegation of Responsibility

Basic to the management of the school plant is the relationship between the school executive and the person charged with the responsibility of administering the various duties of the school business office. The school administrator may be aided by the following guidelines in the delegation of responsibility to this subordinate officer:

1. Carefully detail and assign the duties to be performed.

2. Grant authority to make commitments, to employ the resources of staff and materials furnished to him, and to take necessary action within his assigment.

3. Make the subordinate responsible to the superintendent for the satisfactory performance of the assigned duties.

It might be well to have the above ideas specifically outlined in the written school board policies.

Professionalization of the Business Manager

Great progress has been made in the field of management in business and industry in recent years. Great corporations have evolved new techniques which have influenced to a considerable extent the management of school systems, through executives on boards of education, university programs designed for school business officials, and a copious literature on the subject.[4]

School business officials in Texas have taken note of recent developments in their area, and have begun to move toward a more professional status.

In recent years school business management in Texas has organized itself into a large and dedicated group, holding annual meetings, district conferences,and workshops. This branch of the educational profession is making rapid strides toward improving the quality and standards of business management practices and personnel in schools throughout the state.

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[4] William A. Yeager, *Administration of Non-instructional Personnel and Services* (New York: Harper and Brothers, 1959), p. 142.

Colleges are adding special courses in school business management and accounting to their professional education curriculum.

These trends indicate a realization among educators of the need to professionalize the business management of the public schools.

As the school business manager moves toward professionalization, the following criteria may serve as a guide:

1. A change in attitudes and values pertaining to his position as a professional person, engaged in an important public function.
2. The development of organizations for this purpose on the part of those identified with school business functions.
3. The development of programs of research.
4. The development of college and university programs of preparation for these personnel.
5. The formulation of ethical standards and codes of practice.
6. Movements toward recognition of these standards (licensing, tests, qualifications).

CHECKLIST OF SOME MAJOR FUNCTIONS OF A SCHOOL BUSINESS MANAGER

- Tax assessing-collecting.
- Budget consultant.
- Accounting, bookkeeping, auditing.
- Property records, inventories.
- Insurance.
- Purchasing, delivery, storage.
- Disbursing.
- Payroll.
- Fiscal reports.
- Pupil transportation.
- School cafeteria operation.

Duties and Procedures

In a study made by Rosenstengel and Swiers in 1947,[5] a total of forty-seven specific duties of school business managers are presented. Although there is considerable overlapping in these duties, the study indicates the wide scope of business administration in a school system.

The major duties of a school business manager as related to school plant management are: (1) budgeting for maintenance and operation, (2) property accounting, including insurance, and (3) purchasing, including storage and warehousing. These duties will be discussed in the following pages.

Budgeting

If the provision of a sound instructional program is the heart of a school's operation, the development and implementation of the budget is certainly its life's blood. Budgeting gives intelligent consideration and planning to implementing school program objectives, executing the decisions and policies of the school board, providing essential school services, materials, and equipment, and over-all operation in terms of how schools may serve the needs of public education.

CHECKLIST OF SOME MINOR FUNCTIONS OF A
SCHOOL BUSINESS MANAGER

* School board secretary.
* Supervision of custodial services.
* Architectural planning and construction.
* Athletic department ticket manager.
* Textbook custodian.
* School census trustee.
* Noninstructional personnel administration.
* Supervision of maintenance program.
* Custodian of student activity funds.

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[5] W. E. Rosenstengel and Willard S. Swiers, "Business Administration in City Schools," American School Board Journal, (Series) March, April, May, June, July, and August, 1947.

In his business procedure, the school administrator directly in charge of the annual budget should use all means at his command to arrive at a realistic maintenance and operation figure. Average (national) percentages of the total financial outlay by major budget headings are as follows:[6]

Instructional services	60.2%
Operation of plant	10.4%
Fixed charges	9.0%
Debt service	7.0%
Auxiliary agencies	6.0%
General control	4.0%
Maintenance of plant	2.4%
Capital outlay	1.0%

The percentage outlay for maintenance is probably too low to protect the public investment in school plant. However, the average will include new construction as well as old plants. Older plants require progressively larger outlays for maintenance.

Good budget management for maintenance makes use of a historical file on all major maintenance projects. For example, the cost of sanding and refinishing a gymnasium floor may provide accurate per-square-foot data for renovating other wood floors.

Practical maintenance budgeting policies should be based on the following plan:[7]

1. Review all previous maintenance, including work procedures and materials costs. This helps to avoid work duplication and to decide questions about repair or replacement.

2. Inspect thoroughly all buildings and grounds. All personnel with responsibilities in these areas should take part, i.e., principals, librarians, lunchroom manager, maintenance men, custodians, coaches, etc. Maintenance requests should be submitted by all persons concerned and these requests tabulated as to priority. Some of these can be accomplished with current funds and thus eliminated from the new budget.

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[6] "A Better Basis of Business Administration," American School Board Journal, July, 1959, p. 39.

[7] "Budgeting for Maintenance," Overview, January, 1962, p. 42.

Priorities for budgeting purposes are (1) routine, (2) emergency, and (3) long-range. Routine items are those that fall into the day-to-day category, such as the replacing of window glass, repairing window shades, replacing door hardware, etc. Also in routine priority are seasonal refinishing of certain floors, routine maintenance painting, etc. Emergency priority items may include snow removal, storm damage, etc. Long-range priority items generally include building renovation or modernization, major projects, the cost of which may be spread out over a period of years.

Property Accounting

The management of school property--land, buildings, and equipment--is a phase of business administration that is very important for carrying on the educational program. While large expenditures must necessarily be made for employment of personnel for instruction, the best returns for such expenditures cannot be realized unless the physical plant contributes maximally to the objectives of education.[8]

School property management cannot be properly understood unless one has a knowledge of property classifications. Follows a list of major classifications of school property:

I. Sites

   A. Site identification

   B. Area of site

   C. Cost of site

II. Buildings

   A. Building identification

   B. Size of building

   C. Cost of building

   D. Instruction areas in building

   E. Administration areas in building

   F. Circulation areas in building

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[8] Paul R. Mort, Walter C. Reussers, and John W. Polley, Public School Finance, (New York: McGraw-Hill Book Company, Inc., 1960), p. 465.

G. Service areas in building

H. Service systems in building

III. Equipment

A. Equipment under unit control--a separate unit of itself on equipment record cards, i.e., lawnmower, typewriter, etc.

B. Equipment under group control--items which are the same with respect to function, and are a part of a group, i.e., desks, library books, etc.

Site records kept in the permanent school business office files should include (1) description of the site, (2) how, when, and from whom acquired, (3) cost, (4) the deed records, including surveyor's field notes, (5) the date and cost of improvements, and (6) facts concerning the disposal of the property.

Proper plant management dictates that each item of site, building, and equipment has its own card in a file, and as inventories and adjustments are made, all changes are recorded in the proper place. This practice is an invaluable asset to proper accounting, utilization, and management of school property, and to evaluation and budgeting procedures. It also gives statistics for policy formulation and information for reporting to the public on the condition and progress of education.

School Property Insurance

The management of insurance coverage for school plant property and equipment demands considerable time and specialized training. The average school administrator needs the assistance of professional insurance agents in preparing a plant insurance program.

Procuring bids on the desired school insurance coverage is a sound management technique. A school can work with an association of underwriters, or through a general agent representing local insurance agencies, with all agents sharing in the premium. This will simplify and improve the insurance program.[9]

Preliminaries to the preparation of school insurance specifications for bid purposes involve five steps.[10] These steps are:

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[9] "How to Buy, Save on Insurance," The Nation's Schools, January, 1962, p. 77.

[10] "Soliciting Bids on Insurance," The Nation's Schools, January, 1962, p. 90.

SITE SUMMARY

Type of School Plant Elementary

Kind of Change, I.e., New Site, Addition Improvement, Disposal	Date	Area of Site in Acres	Cost of Sites: Land	Cost of Sites: Improvements	Cost of Sites: Total Cost of Sites	Remarks
Beginning of Year	7-1-59	140	$140,000	$25,000	$165,000	
New Site—Lee School	7-1-59	20	10,000		10,000	
Addition—Cherryhill School	8-21-59	5	3,000	5,000	8,000	Playground area
Improvement—Jackson School	9-15-59			10,000	10,000	Bus garage
Disposal—Johnston School	3-15-60	-12	-6,000	-5,000	-11,000	Sold to Carrier Cargo Lines
Beginning of Year	7-1-60	153	$147,000	$35,000	$182,000	

BUILDING SUMMARY

Type of School Plant Elementary

Kind of Change New Buildings, Additions, Remodeling, Disposal	Date	Number of School Plants	Number of Buildings: Instruction	Number of Buildings: Other	Cost of Buildings: Instruction	Cost of Buildings: Other	Pupil Capacity	Gross Building Area
Beginning of Year	7-1-59	20	21	2	$10,500,000	$90,000	9,000	675,000
New Building—Lee School	9-1-59	1	1		400,000		400	30,000
Remodeling—Jackson School	11-30-59				200,000			
Disposal—Johnston School	3-15-60	-1	-2		-100,000		-400	-28,000
Addition—Davis School	3-20-60				60,000		100	5,200
Beginning of Year		20	20	2	$11,060,000	$90,000	9,100	682,200

BUILDING SUMMARY

Type of School Plant Elementary

Kind of Change, I.e., New Building, Addition Remodeling, Disposal	Date	Number of Classrooms: Regular	Number of Classrooms: Special	Number of Facilities: Libraries	Number of Facilities: Auditoriums	Number of Facilities: Gymnasiums	Number of Facilities: Cafeterias	Number of Facilities: Multi-Purpose
Beginning of Year	7-1-59	300	55	20	4	14	10	8
New Building—Lee School	9-1-59	12	2	1	1	1	1	1
Disposal—Johnston School	3-15-60	-14					-1	
Addition—Davis School	3-20-60	4	1		1	1		
Beginning of Year	7-1-60	302	58	21	6	16	10	9

EQUIPMENT SUMMARY

Type of School Plant Elementary

Kind of Change, I.e., Addition or Disposal	Date	Cost of Furniture	Cost of Machinery and Apparatus	Library Books: Number	Library Books: Cost	Vehicles: Number	Vehicles: Cost
Beginning of Year	7-1-59	$400,000	$20,000	175,000	$300,000		
Equipping New Building Lee School	9-1-59	35,000	3,000	1,200	2,500		
Disposal—Johnston School	3-15-60	-12,000	-2,500				
Beginning of Year	7-1-60	$423,000	$20,500	176,200	$302,500		

Source: "Property Accounting for State and Local School Systems," U.S. Office of Education, Bulletin 1951, No. 22.

Illustrative Inventory of School Property

Figure 13.

THE PROPERTY LEDGER

Building or Equipment Items	Code	Date Acquired	Original Cost	Estimated Value at Beginning of Year	Additions	Replacements and Repairs	Deductions or Losses	Depreciation	Estimated Value at End of Year

THE PROPERTY INVENTORY

Description of Article	Date of Purchase	Unit Cost	Number on Hand and Location												
			1957–1958		1958–1959		1959–1960		1960–1961		1961–1962		1962–1963		
			No.	Room	No.	Room	No.	Room	No.	Room	No.	Room	No.	Room	

BUILDING RECORD FOR INSURANCE

Name and Location	Date of Appraisal	Type of Construction	Building			Contents			
			Insurable Value	Amount of Insurance	Insurance Rate	Insurable Value	Amount of Insurance	Insurance Rate	Class of Insurance

RECORD OF INSURANCE

Date of Problem	Name and Address of Company	Policy Number	Property Insured	Amount of Insurance	Premium	Term of Insurance	Expiration of Policy	Rate of Insurance	Name and Address of Agent

Source: Deer Park, Texas, Independent School District.

Illustrative Property and Insurance Records Form

Figure 14.

1. Appoint a professional insurance adviser.

2. Designate a person to prepare a written analysis of current insurance protection in each area.

3. Have the school board study and discuss this analysis.

4. Agree on features that are to be built into the specifications for each kind of insurance.

5. Decide on the general type of insurance carrier with whom the insurance will be placed and the agents and/or companies from whom bids are to be solicited.

Purchasing

Management of the purchasing function calls for a knowledge of supplies and equipment, both instructional and maintenance. It requires acquaintance with services that can be purchased, and an ability to determine whether these costs are reasonable. It involves an understanding of the purposes for which an item is to be used, how and where it will be utilized, and where it can be obtained.

All materials should be purchased according to written administrative policies. Every purchase order is issued to acquire something which will implement the educational program. The purchase order in most instances will be issued after an approved requisition is submitted to the purchasing agent. (Sample forms for requisitions and purchase orders appear in this chapter, Figures 15 and 16.)

In purchasing supplies, "Let the Buyer Beware" is still a useful warning. We are too often beguiled by periodical advertisements. It still remains the purchasing agent's responsibility to know how each item performs in relation to the uses and demands made of it.

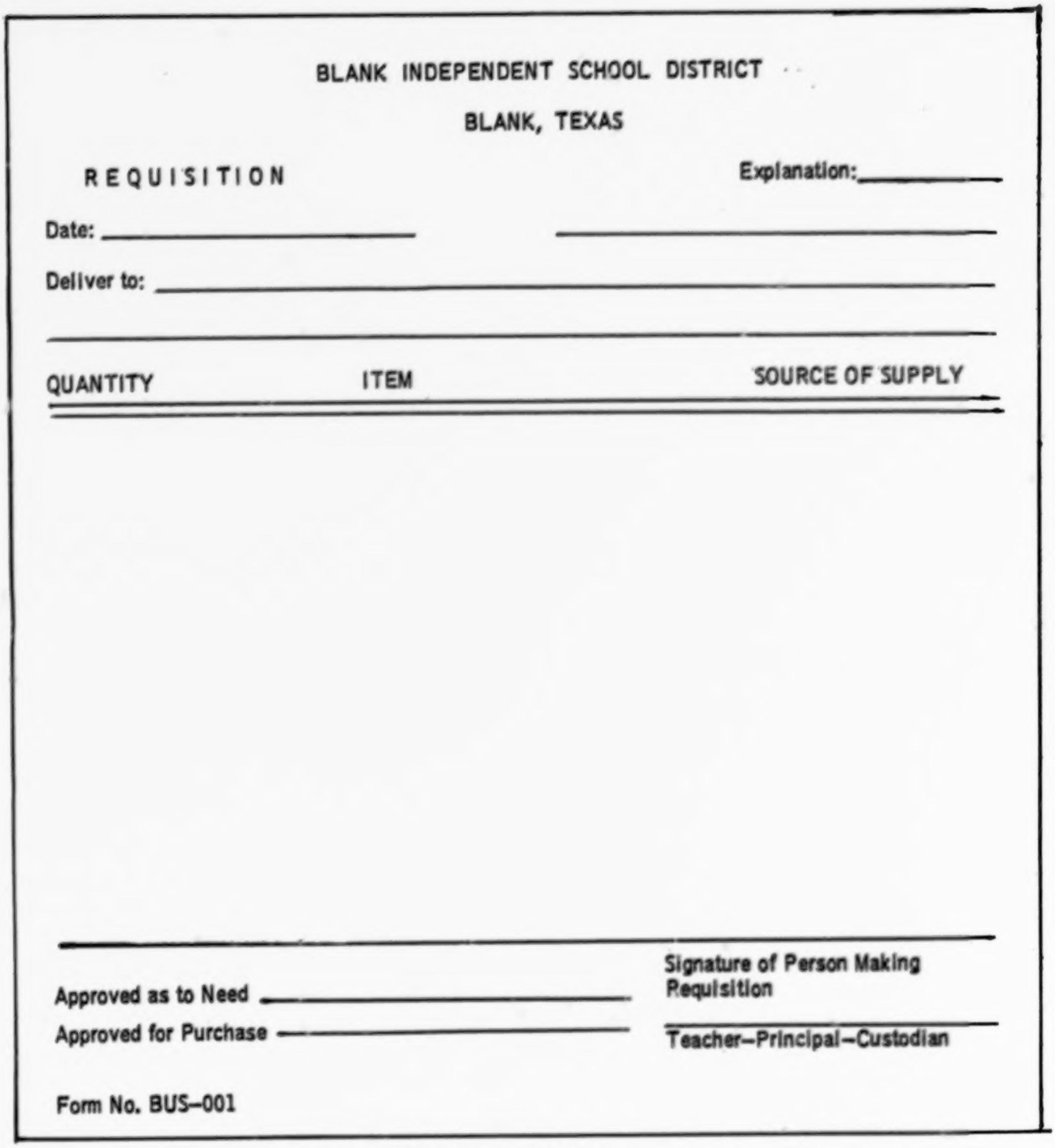
Economies in Purchasing

Management of the school purchasing function becomes an exacting task when one is bound by budgetary limits and committed to the philosophy that every purchase must be justified by educational values and purposes. Utility and economy are the yardsticks of the purchasing agent.

Economy in the purchasing operation may be achieved in the following manner:

1. Standardization of items

2. Purchasing by bids and contracts



BLANK INDEPENDENT SCHOOL DISTRICT

BLANK, TEXAS

REQUISITION

Explanation: ____________

Date: ____________

Deliver to: ____________

QUANTITY ITEM SOURCE OF SUPPLY

Approved as to Need ____________

Approved for Purchase ____________

Signature of Person Making Requisition

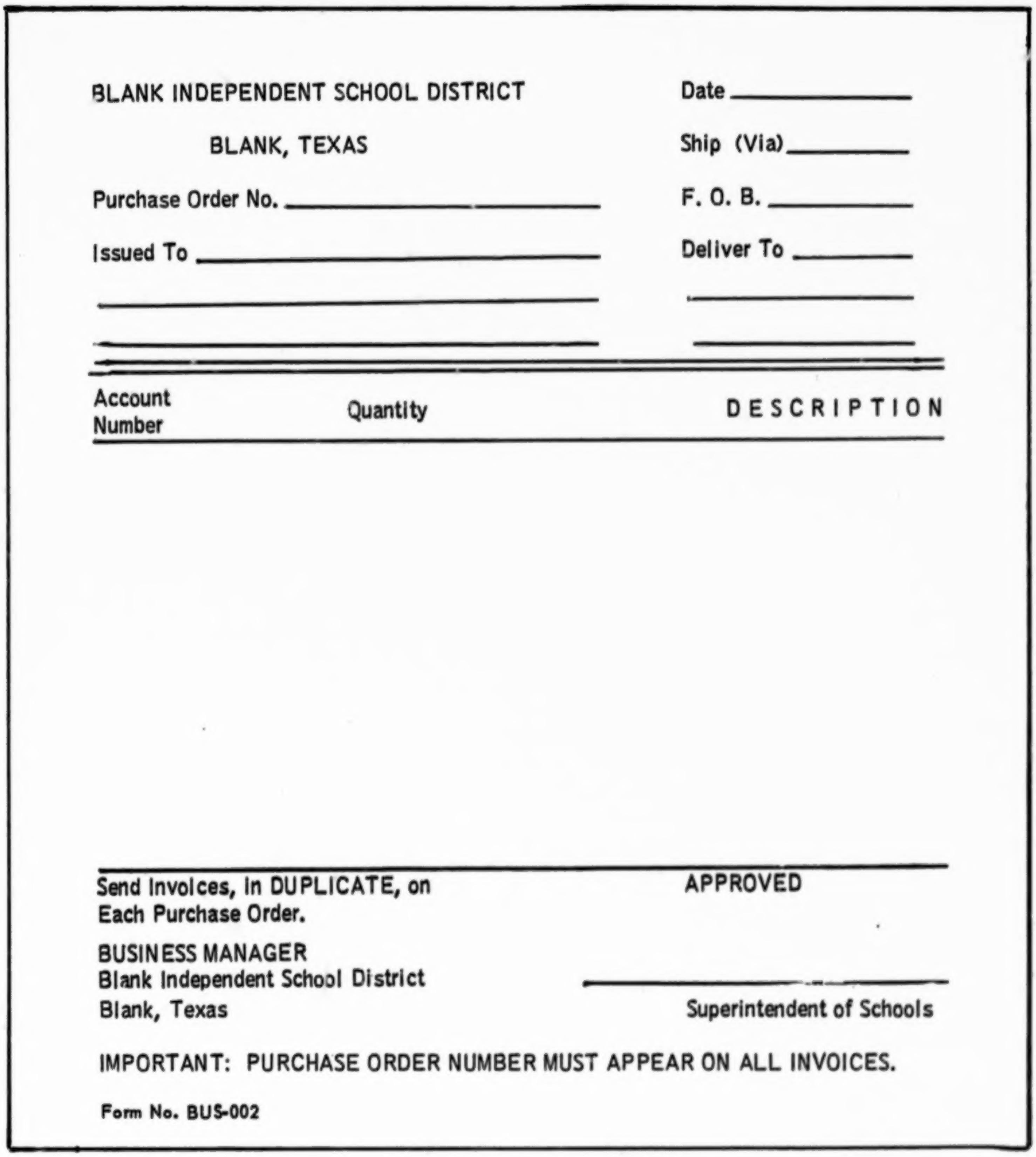
Teacher–Principal–Custodian

Form No. BUS–001

Source: Orange, Texas, Independent School District.

Materials Requisition Form

Figure 15.



BLANK INDEPENDENT SCHOOL DISTRICT

BLANK, TEXAS

Purchase Order No. ______________________

Issued To ______________________

____

____

Date ______________

Ship (Via) ______________

F. O. B. ______________

Deliver To ______________

____

____

Account Number	Quantity	DESCRIPTION

Send Invoices, In DUPLICATE, on
Each Purchase Order.

BUSINESS MANAGER
Blank Independent School District
Blank, Texas

APPROVED

____
Superintendent of Schools

IMPORTANT: PURCHASE ORDER NUMBER MUST APPEAR ON ALL INVOICES.

Form No. BUS-002

Source: Orange, Texas, Independent School District.

Purchase Order Form

Figure 16.

3. Utilization of discounts

    a) Quantity purchasing
    b) Off-season buying
    c) Discounts for prompt payment

4. Efficient delivery, storage, distribution system.

Standardization in Purchasing

Standardized ordering lists are highly desirable for all school systems and virtually essential for large schools. These lists not only permit greater economy of funds but also result in a reduction in labor, allow for fewer purchases and greater volume, reduce indiscriminate ordering, make for simplified inventories and storage problems, and facilitate scheduling of purchases. The use of requisitions may be reduced to minimum, being restricted to non-standard and emergency items.

Expendable items lend themselves readily to standardization. Among these accessories are office supplies (paper, paper clips, rubber bands, staples, mimeograph ink and stencils, duplicator fluid and carbons, etc.), innumerable small items for maintenance and custodial supplies, teaching materials, etc.

Durable items also can be standardized, such as movable power equipment, light fixtures, desks, etc. This procedure allows for maintaining a small stock of repair parts and accessories.

The process of developing standards and specifications is not necessarily difficult. The school administrator, from information obtained from his own staff, can delineate desirable qualities in the supplies and equipment purchased by the school. Office personnel, teachers, and others handling office supplies and equipment, are very often quite outspoken in their praise or criticism of certain items and through experience have come to know quality products. Maintenance men and custodians--the people that work with the tools and supplies--know which product can best do the job for them, in their particular situation.

Standards are a compilation, over a period of time, of the best ideas and practices of persons doing the work or using the supplies. The quality of supplies and equipment is constantly improving, and the know-how of employees improves with experience, so standards are flexible and subject to change.

Purchasing by Bids and Contracts

All purchasing, when possible, should be on a bid basis. Purchasing by contract assures the school of a steady supply and at the prices stipulated in the contract.

The lowest bid is not necessarily the best bid. Care should be exercised that specifications are detailed and explicit to insure quality of materials and of performance. Specifications are handed or mailed to each bidder. Only suppliers with known reputations, both for products and services, should be invited to bid for the school contracts.

Bids are submitted in writing, the date for opening of bids is advertised, and bidders may be present at the opening.

Contract purchasing is an aid to the storage problem. Firms who supply schools on a contract basis actually serve as warehouses for the school system and also reduce the work on inventories. Each supplier knows how much was delivered, on what date, and when and how to deliver the next consignment.

Discounts

Opportunities for substantial savings are often made possible by taking advantage of discounts offered by supplying firms. One of these is in quantity purchasing. Storage space may present a problem here, as well as the probability of spoilage, or deterioration. Many companies will accept large quantity orders and deliver portions of it, as needed.

Quantity purchasing has a definite advantage in addition to a saving of money. It assures a stable supply and lessens the labor of inventory, reordering, and scheduling of deliveries.

Another discount possibility is off-season buying. Manufacturer's labor costs begin to rise when merchandise lies idle in the warehouse. School desks purchased during the winter months may cost a bit less than in summer when the factory is running full blast. Also, products often change to a new model, very slightly different from the former type, and the economy-minded buyer can profit by ordering these "special close outs."

Many firms offer discounts for payment of accounts in full within ten days after receipt of the invoice by the purchaser. This sometimes does not coincide with the regular thirty-day policy of most schools, but over a period of time substantial savings can be effected if the disbursing policies can be altered, and funds made available, to take advantage of the economy offered.

Delivery and Storage

Delivery of supplies and equipment means the act of receiving these items at the school, storing them until they are needed, and distributing them to the proper person or place as they are required.

The delivery of purchases is of two types, (1) that controlled by the purchaser, who either takes immediate delivery of goods, and (2) delivery controlled by the seller. This implies an undetermined time of delivery, as in orders placed for shipment, "on or about the 15th day of August," or, "Back-ordered. Will ship as soon as available." The latter type of delivery also applies to a situation in which a school orders materials which must be manufactured, or must be shipped from a distant source.

Timing of deliveries is the essence of good supply management. Supplies and equipment must be at a given place when needed. This assures an optimal operating climate for the educational program. Factors which condition the timing of deliveries are:

1. Urgency of need
2. Amount of items needed
3. Storage space available
4. Interference with instructional program
5. Service areas available
6. Traffic, parking on and near campus
7. Weather factors (inclemency)
8. Seasonal factors (oil in winter, lumber in summer)
9. Availability of staff (unloading, distributing)

The essentials of good practice in delivery and storage can be summarized as follows:

1. Up-to-date inventories and records
2. Use of requisition forms
3. A central supply warehouse-storage center for large quantities of frequently-used items
4. Smaller storage spaces for individual buildings
5. Training of staff in requisition-delivery-storage system
6. Standardization of supplies
7. Quantity purchasing policy, where possible
8. Contract purchasing and delivery, where possible
9. Distribution system within the school

Summary

School plant management requires careful application of sound business principles to the effective expenditure of public funds.

The primary function of business management in a school is to implement the instructional program.

As business matters begin to require a disproportionate share of his time, a school superintendent should be given relief in business management. This assistant should be delegated authority to make decisions and commitments in his duties, specified in written policies.

The modern school business official has made great strides toward professionalization. District, state, and national organizations are contributing to this movement.

The major duties of a school business manager as related to school plant management are budgeting, property accounting, and purchasing. These duties are detailed in the chapter text.

Suggestions are given as to sound budgeting procedures. The school fiscal agent (business manager) is a valuable side to the superintendent in preparing the annual budget.

Property accounting procedures are briefed for sites, buildings, and equipment; sample forms for property inventories are furnished, and property insurance practices are discussed.

Management of the purchasing operation is based on two major premises, utility and economy. Some suggestions for economies in purchasing are (1) standardization of items, (2) purchasing by bids and contracts, (3) quantity purchasing, and (4) efficient delivery, storage, and distribution of supplies purchased.

The delivery and storage phases of purchasing are discussed, with timing of deliveries mentioned as the essence of good management of supply.

Suggested Readings

"A Better Basis of Business Administration," *American School Board Journal*, July, 1959, pp. 35-41. Comments on the results of a national survey of maintenance costs.

A Guide for Texas Public Schools, Budgeting, Accounting and Auditing, Texas Education Agency, 1961, Bulletin 613. A complete, authoritative plan for Texas school business officials to follow in setting up business office practices, forms and reporting.

Campbell, Roald F., and Russell T. Gregg, *Administrative Behavior in Education*, Harper and Brothers, New York, 1957. Includes a very good discourse on theory and practice in school business administration.

Garber, Lee O., *Law and the School Business Manager*, Inter-state Printers and Publishers, Inc., Danville, Illinois, 1957. Presents, under eleven titles, essential, legal information for the public school business official.

"How Much Should You Pay for Maintenance and Operation?" *School Management*, July, 1960, pp. 51-58. Gives the results of a national "Cost of Education" survey, with some interesting comparisons on low, medium, and high expenditure schools.

"How to Buy, Save on Insurance," *The Nation's Schools*, January, 1962, p. 77. Reports the recommendations of a panel of recognized authorities on school business management.

Knezevich, Stephen J., and John Guy Fowlkes, *Business Management of Local School Systems*, Harper and Brothers, New York, 1960. Serves as a basic text on school business procedures; a practical manual on school financial managment.

Linn, Henry H., *School Business Administration*, The Roald Press Company, New York, 1956. Considered by many business managers their first source of reference in school business administration.

Mort, Paul R., Walter C. Reusser, and John W. Polley, *Public School Finance*, McGraw-Hill Book Company, Inc., New York, 1960. Presents a practical approach to the financial aspects of public school business practices.

Costing, Bernard R., "When Does a School System Need a Business Manager?" *The Nation's Schools*, May, 1957, p. 100. Suggests a yardstick to determine when the school should install a separate business official.

Property Accounting for State and Local School Systems, U. S. Office of Education Bulletin 22, 1959, U. S. Government Printing Office, Washington 25, D. C. Suggests practical systems and furnishes sample forms for school business office procedures in property accounting.

Rosenstengel, W. E., and Willard S. Swiers, "Business Administration in City Schools," *American School Board Journal*, (Series) March, April, May, June, July, and August, 1947. Reports and comments on the findings of a national survey of school business office practices.

School Business Management Handbooks, New York State Department of Education, Albany, New York, 1955. Includes a series of ten handbooks replete with information on all facets of school business administration, compiled by a corps of professional people.

"Soliciting Bids on Insurance," *The Nation's Schools*, January, 1962, p. 90. Discusses the practices reported by a panel of insurance authorities on school insurance.

Yeager, William A., *Administration of the Non-Instructional Personnel and Services*, Harper and Brothers, New York, 1959. Contains a very good discussion on the duties of business office personnel. (Chapters 8, 9.)

CHAPTER XV

EVALUATING SCHOOL PLANT MANAGEMENT PROCEDURES

A school executive, in attempting to assay the effectiveness of his plant management procedures and his own productivity as an administrator, will, from time to time, ask himself the question, "Am I doing a good--fair--poor job of school plant management?" The answer to this query lies in the ability of the administrator to accurately analyze the results of his management program. This chapter will offer some suggestions as to how management may effect a program of evaluation of its own services.

Programming for School Plant Management

An evaluation means a comparison of results to predetermined goals. Programming for school plant management is predicated on educational values and objectives.

Educational Requirements

A necessary first step in programming for school plant management (on which all subsequent action is based) is the formulation of a statement of the school's educational requirements.

The statement of educational requirements should describe the program in detail and should include the following items:

1. Summary statement of educational philosophy for the specific community and school.

2. Location, size, and description of site.

3. Location, size, and description of buildings.

4. Grade levels, with class sizes.

5. Enrollment statistics, present and anticipated.

6. Policy on class sizes and teacher loads.

7. Summary of required teaching stations.

8. Brief description of each classroom as to activities to be carried on, furniture, equipment, storage requirements.

9. Description of outdoor areas as to 8, above.

10. Description of general site with regard to parking requirements, service facilities, etc.

11. Proposed summer use.

12. Proposed community use.

13. Special requirements.

Such a statement forms a valid and objective instrument for evaluating an operational-maintenance program. It also sets up an educationally defensible priority list of maintenance features. If budget considerations demand curtailment of some procedures, either in scope or quality, such a priority list will result in the least possible loss to the educational program.

Manual for Procedures

Large and small schools alike can profit from standardized procedures--in methods of work, in purchasing, in personnel selection, in personnel policies, and in use of tools, equipment and supplies. A detailed manual for procedure is the most valuable asset an administrator can possess. Texas Gulf Coast school districts, at Dickinson, Brazosport, and Conroe, among others, have a well-organized maintenance-custodial manual.[1] A "School Custodian Manual," which is exceptionally well done, is available through the Department of Administrative Education of the College of Education at the University of Houston. There is a valuable guide to the in-service training of custodians--as well as administrators. (Refer to Chapter III for a manual outline.)

Quality of Maintenance and Operation

Several factors make it difficult to maintain comparable maintenance-operation records. Some of these factors are: different ages of buildings, climatic conditions, types of schools, types of construction, types of service systems, condition of grounds, size of site, skill of staff, and the school district's financial condition.

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[1] J. D. Engman (ed.), A Survey of Selected Gulf Coast Schools, 1961.

Lacking other reliable comparable data, many schools measure maintenance and operation costs at a percentage of total current costs, or as so much per pupil in A.D.A. Maintenance must be kept current, otherwise what should be normal maintenance costs may appear later as major remodeling or capital investment replacement costs.

In a nation-wide study done for the United States Office of Education, in 1957, N. E. Viles reports the following sampling:[2]

	Current Costs Percentage of Total	
	Maintenance	Operation
Large cities	4.5	9.8
Medium sized cities.	4.6	10.5
Small cities	3.9	10.5
Very small cities.	4.1	10.2

In a recent "Cost of Education" national survey made by School Management magazine,[3] Texas pays $7.36 per pupil on "low scale," $9.87 on "quality scale," and $12.90 per pupil in the "top tenth" bracket, for maintenance and operation expenditures. This is compared to the national averages, which are $15.86 "low," $22.13 "quality," and $30.27 for "top tenth."

A school administrator who wishes to know where his school stands as compared to local and national school averages may figure his own costs (divide total expenditures for maintenance and operation, including salaries, by the A.D.A.) and compare the following statistics:

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[2] N. E. Viles, "Maintaining and Replacing Schools," The American School Board Journal, July, 1959, p. 49.

[3] "How Much Should You Pay for Maintenance and Operation?" School Management, July, 1960, pp. 51-58.

In the cost survey reported above, the "low" Texas school district has 4.27 custodians per 1,000 students, the "quality" school has 5.54, and the "top tenth" has 7.11 custodians per 1,000 students. As to salaries in Texas, only $2.13 is alloted per pupil for maintenance salaries in the average schools, $4.93, in the "quality" class, and $7.57 in the "top" group.

These figures do not reveal whether they are an indication of a district's ability or desire to pay for maintenance, but at least they form a basis for comparison. How much a district can afford will depend on the quality of maintenance desired. The School Management survey further states that expenditures for plant maintenance and operation are a good indicator of over-all school quality.

CHECKLIST OF FACTORS THAT DETERMINE THE AMOUNT AND COST OF MAINTENANCE

* Design - ease of maintenance.

* Climate - rate of deterioration due to climate factors, i.e., metals corroded by salty seacoast atmosphere.

* Function - what buildings, grounds are used for; how much use and respect accorded by public and pupils.

* Age, number, and type of facilities--these factors are self-evident.

* Standards of service - low, average, or high.

* Managerial efficiency - skill and acumen of maintenance personnel, basic to efficiency and economy.

* Wage levels - local wage rates affect labor supply; low pay often means low standards.

* Cost of supplies and equipment - efficient procurement is basic to economy and efficiency.

Inspections and Reports

Sound management procedures call for a thorough survey and inspection of all existing plant facilities. School management must know where it is and what it is before facilities can be properly maintained. This includes all portions of school facilities, namely, site, buildings, and equipment (furniture and fixtures).

Which member of the administrative staff conducts these inspections depends on the size and the type of school organization. A principal should daily observe the condition of his school area as to cleanliness and orderliness. The principal, with his building custodian, should make frequent periodic inspections of the specific school plant. The superintendent also should make periodic inspection of the entire plant, perhaps at longer intervals, accompanied by his head custodian or maintenance chief.

These inspections, it might be noted, are not fault-finding tours, but "stitch in time" surveys so that current needs can be met and future needs ascertained.

Custodians and maintenance workers should also be alert to report any defects they notice as they make their daily rounds and carry out routine chores.

Needless to say, an inspection tour is useless without a written report, and reports are of no value unless followed by action to correct any defects found. Inspections should be made by checklists, which form the basis of reporting procedures.

On the following page is a list of minimum inspections. Employees may be assigned certain elements to inspect and report upon.

Procedures in Evaluation

Evaluation includes definition of goals to be attained, observations, both quantitative and qualitative, standards, and degrees of accomplishment. It includes some estimates of attitudes, interests, ideals, way of thinking, work habits, and personal and social adjustment.

In school plant management, evaluation is a part of the total process. It comprehends evaluation of the processes as well as of the personnel. It is a continual endeavor in which group participation is essential.

Evaluative Criteria

Any evaluative effort anent the general maintenance operation program covers the following areas:

1. The physical properties of the entire school plant--to be kept in a good state of repair.

CHECKLIST OF ITEMS OF SCHOOL PLANT TO BE CHECKED PERIODICALLY:[4]

Item	Frequency (Times Yearly)
EXTERIOR	
Foundation	1
Drainage	1
Concrete	1
Brick	1
Roofing	2
Flashings	2
Calking, glazing	2
Painting	1
Ventilators	1
Fences	1
Sidewalks	2
Drives, Parking area	1
Culverts	1
Playground safety	3
Landscape Maintenance	2
Bleachers	1
Incinerator	3
ELECTRICAL	
Stage switch board	2
Exit lighting	2
Clock system	1
Telephone system	1
Fire alarm system	2
Fire safety devices	1
Refrigeration	2
Athletic Scoreboard	1

Item	Frequency (Times Yearly)
INTERIOR	
Floor Maintenance	5
Ceiling Maintenance	3
Interior Walls	2
Stairways	2
Handrails	4
Hardware	3
Window shades, blinds	3
Gymnasium apparatus	3
Gymnasium bleachers	3
HEATING-VENTILATING	
Hot water system	3
Boiler Maintenance	9
Unit ventilators	9
Ducts	2
Filters	2
Temperature Controls	2
MISCELLANEOUS	
Plumbing system	2
Grease traps	3
Gas appliances	5
Shop equipment	2

(Refer to detailed Master Checklists for the above items, beginning on Page 220, this chapter.)

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[4] N. L. George, *Operation Manual*, Oklahoma City Public Schools, 1957, p. 59.

2. The safety and health of the occupants--must be adequately and constantly safeguarded.

3. Welfare services for the occupants--must be continuous and stable. (This includes comfort, convenience, attractiveness.)

4. There is no interference with the educational program except in emergencies.

5. The program accomplishes the above purposes within reasonable budgetary limits.

Evaluation Procedures

Suggested procedures for the program of evaluating school plant management are as follows:

1. Determine areas and processes to be evaluated in terms of original purposes and goals to be achieved.

2. Evaluation processes to be clearly understood by all concerned. Purpose? Method? To accomplish what?

3. Determine criteria (see above) to analyze results.

4. Interpreting results. (Graphs, charts, written summaries.)

Evaluative Procedural Standards

Following are brief, sample standards which may serve as guidelines for the school administrator to determine areas and processes to be evaluated. This outline will admit much enlarging as to scope and detail.

1. Operating Procedures: The work of management is guided by written policies. These policies cover all phases of management. They periodically are reviewed and up-dated. They set forth the educational goals of the school.

2. Delegation of Responsibility: A clear chain of command is established. Authority is delegated to competent, loyal staff assistants to make commitments in their sphere of activity. Assistants are trained in service for present position and for promotion.

3. Decision-making: Decisions are made after facts are ascertained. Expert advice is sought on matters not in the sphere of experience of the administrator. All decisions are based on school

philosophy and, as far as possible, on standard operating procedures. Risks are carefully weighed against values of outcomes. Once made, decisions are final, subject only to review by the school board. The administrator views himself as the controller of decision-making, rather than as the maker of all decisions for the organization.

4. General Knowledge: The administrator understands the purpose of school plant management. He knows the basic elements of a sound educational curriculum and how to organize and conduct the program of studies and activities. He understands maintenance and operation matters. He has the ability to organize and conduct budgeting operations for the entire school program.

5. Public Relations: The general public is satisfied with the school program, proud of the school plant and grounds. Recent improvements have been accepted and bond issues have been successful. The superintendent is often asked to speak in public. There is no schism between the school board and the administration. There is a feeling of mutual respect between the superintendent and his principals, between the administration and faculty, and among the non-instructional staff. Parent groups, civic clubs, and professional organizations willingly support school activities and are in turn supported by school personnel. Good relations are enjoyed with neighboring school districts.

6. Personnel Organization and Administration: All school employees are competent, loyal, and trustworthy. Individual and group goals are compatible. Morale is achieved by involving personnel in the establishment of goals. A line and staff organizational chart is used, and clear, rapid communications are established via this chain of command. A system of position classification is employed. Standard practices include a teacher's handbook and a maintenance-operation manual.

Summary

The school plant administrator needs periodically to evaluate his management program in the light of the school's established educational goals.

The program of evaluation is best begun with a statement of the educational requirements of the school. A manual of procedure, based on these aims, is suggested as a reliable index of good management procedure.

Quality of maintenance and operation is an indication of overall school quality. Some factors affecting quality are: ages of buildings, climatic conditions, types of construction, size of site, and the financial condition of the school district.

Sound management procedures call for a periodic, thorough survey of all existing school plant facilities. General and detailed checklists for plant inspections are furnished.

Procedures are suggested whereby the administrator may evaluate his management program. Evaluative criteria are listed and brief standards are suggested for operating procedures, delegation of responsibility, decision-making, general knowledge, public relations, and for personnel organization and administration.

MASTER CHECKLIST #1

SCHOOL SITE

____
Name of School

____
Date

Condition Remarks

I. Drainage:
Entire Area
New Buildings

II. Soil:
Top Soil

III. Special Areas:
Play Areas
  Apparatus
Hard Surfaced
Loading Areas
Foot Scrapers

IV. Service Areas:
Parking
  Bicycles
  Cars
Drives
  Lighting-night
Sidewalks
  On Grade
  Off Grade

V. Landscaping

VI. Fencing:
Fence
Gates
Posts (barrier)

VII. Miscellaneous:
Flag Pole
Retaining Walls

VIII. Other

Master Checklists #1 through #11
adapted from N. L. George, *Operation Manual*, Oklahoma City Schools, 1957.

____
Employee Checking

MASTER CHECKLIST #2

EXTERIOR OF BUILDING

Name of School

Date

The most vulnerable of all exterior surfaces to the effects of the weather is the roof. Every roof is a separate problem and should receive regular inspection.

		Condition	Remarks
I.	Roof:		
	A. Roof, General		
	Seams		
	Ridges		
	Hollows		
	Drains		
	Coping		
	B. Miscellaneous:		
	Cornices		
	Gutters		
	Headers		
	Flashings		
	Downspouts		
	Drains		
	Parapet Walls		
	Copings		
	Attic (vented)		
	Dormers		
	Chimney		
	Skylights		
II.	Walls:		
	Settlement cracks		
	Seepage		
	Lintels		
	Exposed Surfaces, Paint		
	Waterproofing		
	Dampproofing		
III.	Foundation:		
	Cracking		
	Drainage		
	Vents		
IV.	Openings:		
	A. Windows and Transoms		
	Paint		
	Panes		

MASTER CHECKLIST #2 (continued)

Condition Remarks

Sills
Calking
Glazing
Operation
Weatherstripping
Screens
  Protective
  Fly
Ledges

B. Doors:
Paint
Operation
Frames
Glass
Weatherstripping
Checks
Holders
Panic Hardware
Kick Plates
Thresholds
Locks

C. Entrances and Porches:
Paint
Steps
Stonework
Ramps
Platform
Overhang
Lighting

D. Fire Escapes:
Paint
Solidity

V. Fire Hydrants:
Date Tested
Paint

VI. Signal Devices

VII. Lighting

VIII. Hose Bibs

IX. Other

Employee Checking

MASTER CHECKLIST #3

INTERIOR OF BUILDING

A. CIRCULATION AREAS

Name of School

Date

Condition Remarks

I. Walls

II. Stairs:
Treads
Handrails
Stair Lighting

III. Exit Facilities:
Marked

IV. Floors:
Baseboards
Floor Mats

V. Traffic Signs:
Marked

VI. Lockers

VII. Fire Apparatus:
Extinguishers
Alarms

VIII. Trim in Corridors

IX. Bulletin Boards

X. Display Areas

XI. Trophy Cases

XII. Wall Plugs

XIII. Lighting

XIV. Heating

XV. Drinking Fountains

XVI. Dispensers

XVII. Adjacent Floor Area

XVIII. Other

Employee Checking

MASTER CHECKLIST #4

INTERIOR OF BUILDING

B. SANITARY FACILITIES

____
Name of School

____
Date

Condition Remarks

I. Toilets: ____________________
Floor ____________________
Ceiling ____________________
Windows ____________________
Doors ____________________
Partitions ____________________
Ventilation ____________________

II. Lights ____________________

III. Heating ____________________

IV. Fixtures: ____________________
Stools ____________________
 Adequacy ____________________
 Siphon Valves ____________________
 Open Ended Seats ____________________
Lavatories ____________________
Urinals ____________________
Mirrors ____________________
Toilet Tissue Holders ____________________
Paper Towel Holders ____________________
Waste Receptacles ____________________

V. Faucets ____________________

VI. Other ____________________
____
____
____

____
Employee Checking

MASTER CHECKLIST #5

INTERIOR OF BUILDING

C. BOILER ROOMS

Name of School

Date

Condition Remarks

I. Fire Resistant Materials

II. Condition of Doors:
Interior
Exterior

III. Floor

IV. Paint

V. Cleanliness

VI. Incinerator

VII. Apparatus:
Boilers
Sump Pumps
Recirculating Pumps
Hot Water Heaters
Other

VIII. Radiators

IX. Valves

X. Thermostats

XI. Pipe Covering

XII. Unit Ventilators

XIII. Other

Employee Checking

MASTER CHECKLIST #6

INTERIOR OF BUILDING

D. GENERAL CLASSROOMS

Name of School

Date

Condition Remarks

I. Floors

II. Walls:
  Paint
  Plaster

III. Ceilings:
  Paint
  Acoustical

IV. Windows:
  Panes
  Sills
  Shades
  Drapes, if any
  Curtains
  Venetian Blinds

V. Chalkboards

VI. Tackboards

VII. Map Holders

VIII. Flag Holder

IX. Lighting

X. Heating

XI. Ventilation

XII. Built-ins:
  Storage
  Lockers

XIII. Wall Plugs

MASTER CHECKLIST #6 (continued)

		Condition	Remarks
XIV.	Shelving		
XV.	Bookcases		
XVI.	Sink Tops:		
	Faucets		
	Drinking Fountains		
XVII.	Hardware:		
	Locks on Doors		
	Locks on Cabinets		
	Window Latches		
	Window Lifts		
	Door Holders		
	Push Plates		
	Kick Plates		
	Door Hinges		
XVIII.	Trim - Wood		
	Evidence of Termites		
XIX.	Other		

Employee Checking

MASTER CHECKLIST #7

INTERIOR OF BUILDING

E. SPECIAL ROOMS

Name of School

Date

(Special classrooms; science, home training, business, art, shops) Condition Remarks

I. Floors

II. Ceilings

III. Walls

IV. Windows:
Panes
Sills
Shades
Drapes, if any
Curtains
Venetian Blinds

V. Chalkboards

VI. Tackboards

VII. Flag Holders

VIII. Chart Holders

IX. Lighting

X. Heating

XI. Ventilation:
General Area
Storage Areas

XII. Condition of Storage Rooms

XIII. Equipment

XIV. Electrical Receptacles

XV. Shelving

XVI. Bookcases

XVII. Other

Employee Checking

MASTER CHECKLIST #8

INTERIOR OF BUILDING

F. LARGE MEETING AREAS

Name of School

Date

Condition Remarks

I. Auditorium:
All Items in #7 Which Apply
Seating
Curtains
Stage
Cleanliness
Storage

II. Gymnasium:
All Items in #7 Which Apply
Bleachers
  Folding
  Permanent
Dressing Rooms
  Cleanliness
  Lockers
  Showers
  Toilets
  Drains
Storage Rooms

III. Food Service:
All Items in #7 Which Apply
Social Areas
Kitchen
Storage
Apparatus
Teachers' Dining Area
Grease Traps

IV. Other

Employee Checking

MASTER CHECKLIST #9

INTERIOR OF BUILDING

G. CUSTODIAL QUARTERS

____
Name of School

____
Date

(Custodial quarters, storage spaces, and workrooms)	Condition	Remarks
I. Storage of Supplies		
II. Cleanliness		
III. Slop Sinks (hot and cold water)		
IV. Shelving		
V. Electrical Outlets		
VI. Lighting		
VII. Fire Safety Provisions		
VIII. Other		

____
Employee Checking

MASTER CHECKLIST #10

INTERIOR OF BUILDING

H. ADMINISTRATIVE AND HEALTH AREAS

Name of School

Date

Condition Remarks

I. Floors

II. Walls

III. Ceilings

IV. Lighting

V. Paint

VI. Toilets

VII. Sinks

VIII. Other

Employee Checking

MASTER CHECKLIST #11

ELECTRICAL SERVICES

Name of School

Date

Condition Remarks

I. Lighting

II. Underground Service

III. Services:
Audio-Visual
Bell and Signal System
Outside Signal System
Program Clocks
Public Address System
Telephone
Television
Fire Alarm System

IV. Flood Lighting Entrances

V. Electric Ranges

VI. Electric Refrigerators

VII. Electric Dishwashers

VIII. Lighting Protection

IX. Duplex Outlets

X. Other

Employee Checking

Suggested Readings

Cameron, John, *Trends in Planning*, U. S. Office of Education, (Pamphlet), Washington, D. C., 1960. Presents contemporary ideas in school plant planning.

Ducker, Henry C., "Try a Check List, Mr. Superintendent," *School Executive*, July, 1955, p. 46. Offers valuable suggestions on evaluation through use of checklists.

Fernalld, Otto K., "How to Save Money on Maintenance," *School Management*, November, 1959, p. 51. Includes some very good ideas on evaluation of school maintenance.

George, N. L., *Operation Manual*, Oklahoma City Schools, Maintenance Department, Oklahoma City, 1957. Deals with various maintenance-operation procedures. Invaluable as a guide for evaluative criteria.

"How Much Should You Pay for Maintenance and Operation?" *School Management*, July, 1960, pp. 51-58. Gives the results of a nation-wide survey on cost of education.

Linn, Henry H., *et al*, *Checklist Forms for Rating School Custodial Service*, Teachers College, Columbia University, New York, 1940. Contains detailed checklists to be used in inspecting maintenance-operation work in schools.

Linn, Henry H., L. C. Helm and K. P. Grabarkiewicz, *The School Custodian's Housekeeping Handbook*, Bureau of Publications, Teachers College, Columbia University, New York, 1948. Furnishes standards for school housekeeping that are the "bible" of this field.

March, C. A., *Building Operation and Maintenance*, McGraw-Hill Book Company, New York, 1950. Examines the total program of operation and maintenance, including evaluative aspects.

U. S. Office of Education, *Improving School Custodial Service*, FSA Bulletin 13, Superintendent of Documents, Washington, D. C., 1949. Furnishes checklists which form a good basis for evaluation of custodial services.

Viles, N. E., "Maintaining and Replacing Schools," *American School Board Journal*, July, 1959, pp. 22-49. Provides a practical outline for programming for maintenance and operation.

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